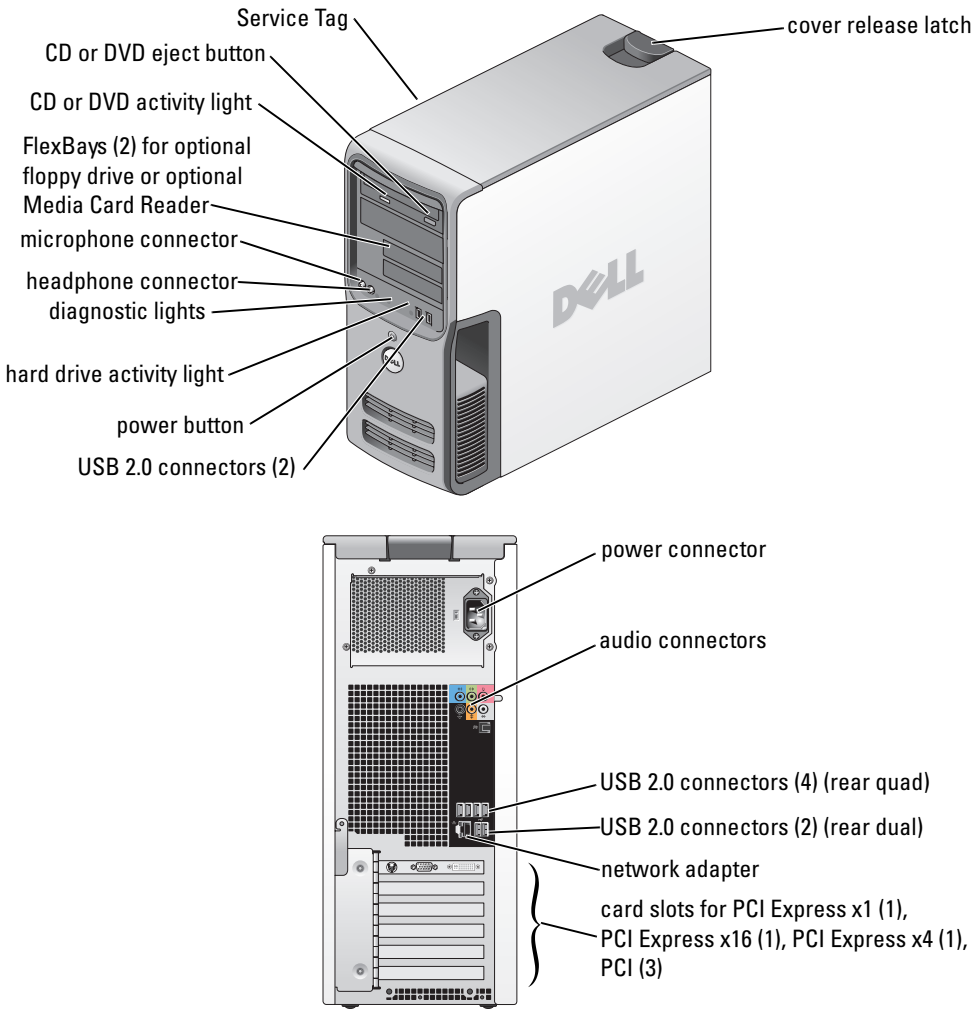
Dell™ XPS™ 410

Owner's Manual


Service Tag
CD or DVD eject button
CD or DVD activity light
FlexBays (2) for optional floppy drive or optional Media Card Reader
microphone connector
headphone connector
diagnostic lights
hard drive activity light
power button
USB 2.0 connectors (2)
cover release latch
power connector
audio connectors
USB 2.0 connectors (4) (rear quad)
USB 2.0 connectors (2) (rear dual)
network adapter
card slots for PCI Express x1 (1), PCI Express x16 (1), PCI Express x4 (1), PCI (3)

Model DCTA

Notes, Notices, and Cautions

NOTE: A NOTE indicates important information that helps you make better use of your computer.

NOTICE: A NOTICE indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

CAUTION: A CAUTION indicates a potential for property damage, personal injury, or death.

If you purchased a Dell™ n Series computer, any references in this document to Microsoft® Windows® operating systems are not applicable.

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Model DCTA

October 2007 P/N YH251 Rev. A02

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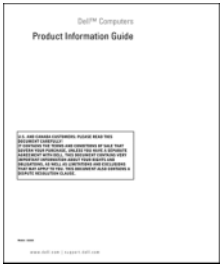
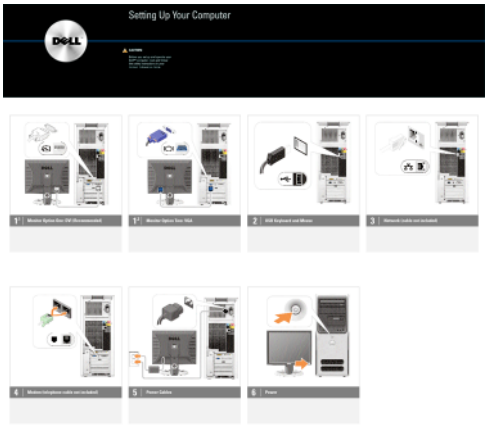
Finding Information

NOTE: Some features or media may be optional and may not ship with your computer. Some features or media may not be available in certain countries.

NOTE: This Owner's Manual is available as a PDF at **support.dell.com**.

NOTE: Additional information may ship with your computer.

What Are You Looking For?	Find It Here
• A diagnostic program for my computer • Drivers for my computer • My device documentation • Desktop System Software (DSS)	**Drivers and Utilities CD (ResourceCD)** **NOTE:** The *Drivers and Utilities* CD may be optional and may not ship with your computer. Documentation and drivers are already installed on your computer. You can use the CD to reinstall drivers (see "Drivers" on page 54), run the Dell diagnostics (see "Dell Diagnostics" on page 52), or access your documentation. Readme files may be included on your CD to provide last-minute updates about technical changes to your computer or advanced technical reference material for technicians or experienced users. **NOTE:** Drivers and documentation updates can be found at **support.dell.com**.
• Warranty information • Terms and Conditions (U.S. only) • Safety instructions • Regulatory information • Ergonomics information • End User License Agreement	**Dell™ Product Information Guide** 

What Are You Looking For?	Find It Here
• How to set up my computer	**Setup Diagram** 
• Service Tag and Express Service Code • Microsoft® Windows® Product Key Label	**Service Tag and Microsoft Windows Product Key** These labels are located on your computer. • Use the Service Tag to identify your computer when you use **support.dell.com** or contact support. • Enter the Express Service Code to direct your call when contacting support.

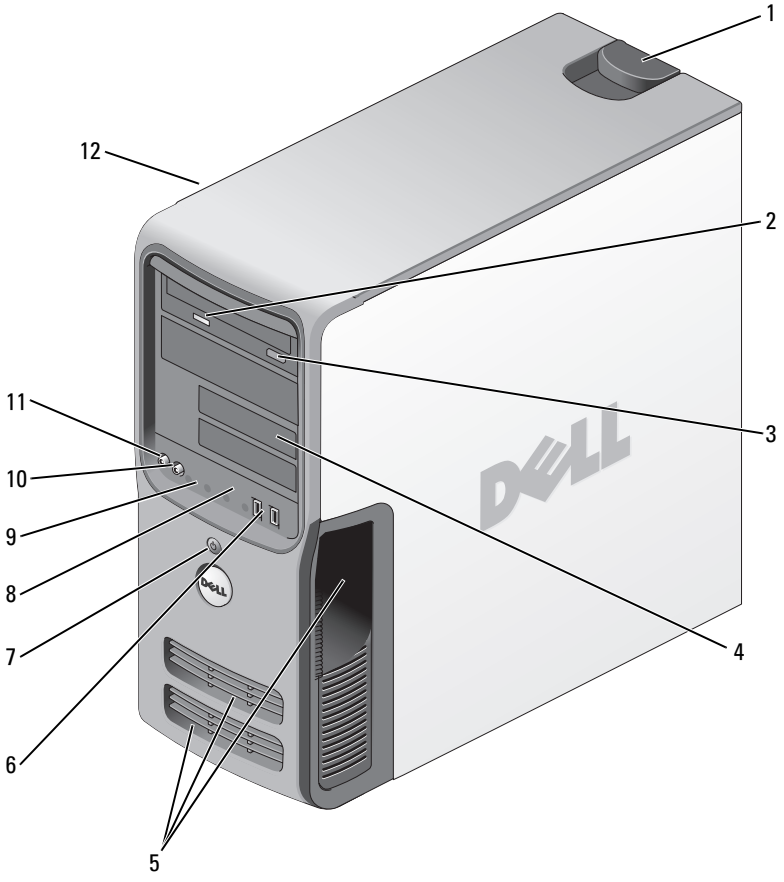
What Are You Looking For?	Find It Here
• Solutions — Troubleshooting hints and tips, articles from technicians, online courses, and frequently asked questions • Community — Online discussion with other Dell customers • Upgrades — Upgrade information for components, such as the memory, hard drive, and operating system • Customer Care — Contact information, service call and order status, and warranty and repair information • Service and support — Service call status, support history, service contract, and online discussions with support • Reference — Computer documentation, details on my computer configuration, product specifications, and white papers • Downloads — Certified drivers, patches, and software updates • Desktop System Software (DSS)— If you reinstall the operating system for your computer, you should also reinstall the DSS utility. DSS automatically detects your computer and operating system and installs the updates appropriate for your configuration, providing critical updates for your operating system and support for Dell™ 3.5-inch USB floppy drives, Intel® processors, optical drives, and USB devices. DSS is necessary for correct operation of your Dell computer.	**Dell Support Website — support.dell.com** **NOTE:** Select your region or business segment to view the appropriate support site. To download Desktop System Software: **1** Go to **support.dell.com**, select your region or business segment, then enter your Service Tag or product model. **2** Select **Drivers & Downloads**, then click **Go**. **3** Select your operating system and language, and then search for the keyword *Desktop System Software*. **NOTE:** The support.dell.com user interface may vary depending on your selections.
• How to use Windows XP • How to work with programs and files • How to personalize my desktop	**Windows Help and Support Center** **1** Click **Start→ Help and Support**. **2** Type a word or phrase that describes your problem and click the arrow icon. **3** Click the topic that describes your problem. **4** Follow the instructions on the screen.

What Are You Looking For?	Find It Here
• How to reinstall my operating system	**Operating System CD** **NOTE:** The *Operating System* CD may be optional and may not ship with your computer. The operating system is already installed on your computer. To reinstall your operating system see "Restoring Your Operating System" on page 56 After you reinstall your operating system, use the *Drivers and Utilities* CD (*ResourceCD*) to reinstall drivers for the devices that came with your computer. Your operating system product key label is located on your computer. **NOTE:** The color of your CD varies according to the operating system you ordered.
• How to use Linux • E-mail discussions with users of Dell Precision™ products and the Linux operating system • Additional information regarding Linux and my Dell Precision computer	**Dell Supported Linux Sites** • linux.dell.com • lists.us.dell.com/mailman/listinfo/linux-precision

1

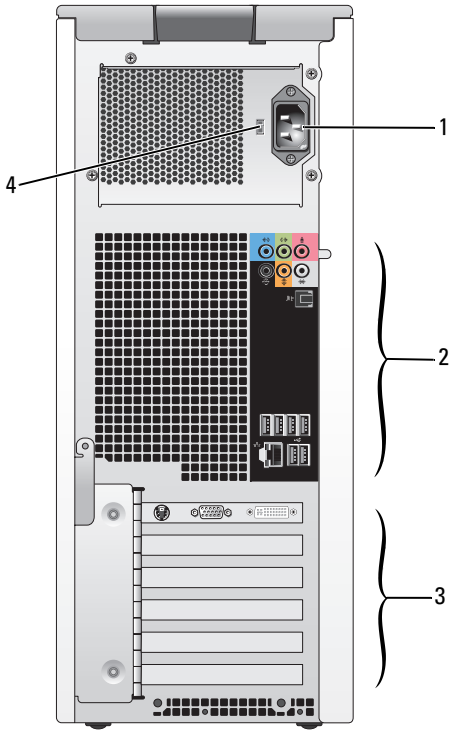
Setting Up and Using Your Computer

Front View of the Computer



1	cover release latch	Use this latch to remove the cover (see "Removing the Computer Cover" on page 78).
2	CD or DVD activity light	The CD or DVD drive light is on when the computer reads data from or writes data to the CD or DVD drive.
3	CD or DVD eject button	Press the CD or DVD eject button to eject a disc from the CD or DVD drive.
4	FlexBay drives (2)	Can contain an optional floppy drive or optional Media Card Reader. For information on using the Media Card Reader, see "Using a Media Card Reader (Optional)" on page 31.
5	vents	For adequate cooling, do not block any of the vents. **NOTICE:** Ensure that there is a minimum of two inches of space between all vents and any object near the vents. **NOTICE:** Keep the vent area clean and dust-free to ensure that the system is adequately ventilated. Use only a dry cloth to clean the vent area to avoid water damage to the system.
6	USB 2.0 connectors (2)	Use the front USB connectors for devices that you connect occasionally, such as flash memory keys, cameras, or bootable USB devices. For more information on booting to a USB device, see "System Setup Options" on page 129. **NOTE:** It is recommended that you use the back USB connectors for devices that typically remain connected, such as printers and keyboards.
7	power button	Press the power button to turn on the computer. **NOTICE:** To avoid losing data, do not use the power button to turn off the computer. Instead, perform an operating system shutdown.
8	hard-drive activity light	The hard-drive light is on when the computer reads data from or writes data to the hard drive. The light may also be on when a device such as a CD player is operating.
9	diagnostic lights (4)	Use the sequence of the diagnostic lights to help you troubleshoot a problem with your computer (see "Diagnostic Lights" on page 49).
10	headphone connector	Use the headphone connector to attach headphones and most kinds of speakers.
11	microphone connector	Use the microphone connector to attach a personal computer microphone for voice or musical input into a sound or telephony program.
12	Service Tag	Use the Service Tag to identify your computer when you access the Dell Support website or contact support.

Back View of the Computer



1	power connector	Insert the power cable.
2	back I/O connectors	Plug USB, network, S/PDIF, and audio devices into the appropriate connectors (see "Back Panel Connectors" on page 16).
3	card slots (6)	Access connectors for any installed PCI or PCI Express cards.
4	power selection switch	Manually select AC input power: 115 volts or 230 volts

Back Panel Connectors

1	link integrity light	• Green — A good connection exists between a 10-Mbps network and the computer. • Orange — A good connection exists between a 100-Mbps network and the computer. • Yellow — A good connection exists between a 1000-Mbps (1-Gbps) network and the computer. • Off — The computer is not detecting a physical connection to the network.
2	network adapter connector	**NOTICE:** Do not plug a telephone cable into the network connector. Use the network adapter connector to attach your computer to a network or broadband device. Connect one end of a network cable to either a network jack or your network or broadband device, and then connect the other end of the network cable to the network adapter connector on your computer. A click indicates that the network cable has been securely attached. On computers with an additional network connector card, use the connectors on the card and on the back of the computer when setting up multiple network connections (such as a separate intra- and extranet). **NOTE:** It is recommended that you use Category 5 wiring and connectors for your network. If you must use Category 3 wiring, force the network speed to 10 Mbps to ensure reliable operation.
3	network activity light	Flashes a yellow light when the computer is transmitting or receiving network data. A high volume of network traffic may make this light appear to be in a steady "on" state.
4	USB 2.0 connectors (2) (rear dual)	Use the back, rear-dual USB connectors for devices that typically remain connected, such as printers and keyboards. **NOTE:** It is recommended that you use the front USB connectors for devices that you connect occasionally, such as joysticks, cameras, or bootable USB devices.

5	USB 2.0 connectors (4) (rear quad)	Use the back, rear-quad USB connectors for devices that typically remain connected, such as printers and keyboards. **NOTE:** It is recommended that you use the front USB connectors for devices that you connect occasionally, such as joysticks, cameras, or bootable USB devices.
6	surround sound connector	Use the (black) surround sound connector to attach multichannel-capable speakers. On computers with a sound card, use the connector on the card.
7	line-in connector	Use the (blue) line-in connector to attach a record/playback device such as a cassette player, CD player, or VCR. On computers with a sound card, use the connector on the card.
8	line-out/headphone connector	Use the (green) line-out connector to attach headphones and most speakers with integrated amplifiers. On computers with a sound card, use the connector on the card.
9	microphone connector	Use the (pink) microphone connector to attach a personal computer microphone for voice or musical input into a sound or telephony program. On computers with a sound card, use the connector on the card.
10	center/subwoofer LFE connector	Use the (orange) center/subwoofer connector to attach a center speaker or a single subwoofer. On computers with a sound card, use the connector on the card. **NOTE:** The LFE (Low Frequency Effects) Audio channel, found in digital surround sound audio schemes, carries only low frequency information of 80 Hz and below. The LFE channel drives a subwoofer to provide extremely low bass extension. Systems not using subwoofers can shunt the LFE information to the main speakers in the surround sound setup.
11	side surround sound connector	Use the (gray) side surround sound connector to attach multichannel-capable speakers. The side-surround output provides enhanced surround audio for computers with 7.1 speakers. On computers with a sound card, use the connector on the card.
12	S/PDIF connector	Use the S/PDIF connector to transmit digital audio without going through an analog audio conversion process. On computers with a sound card, use the connector on the card.

Connecting Monitors

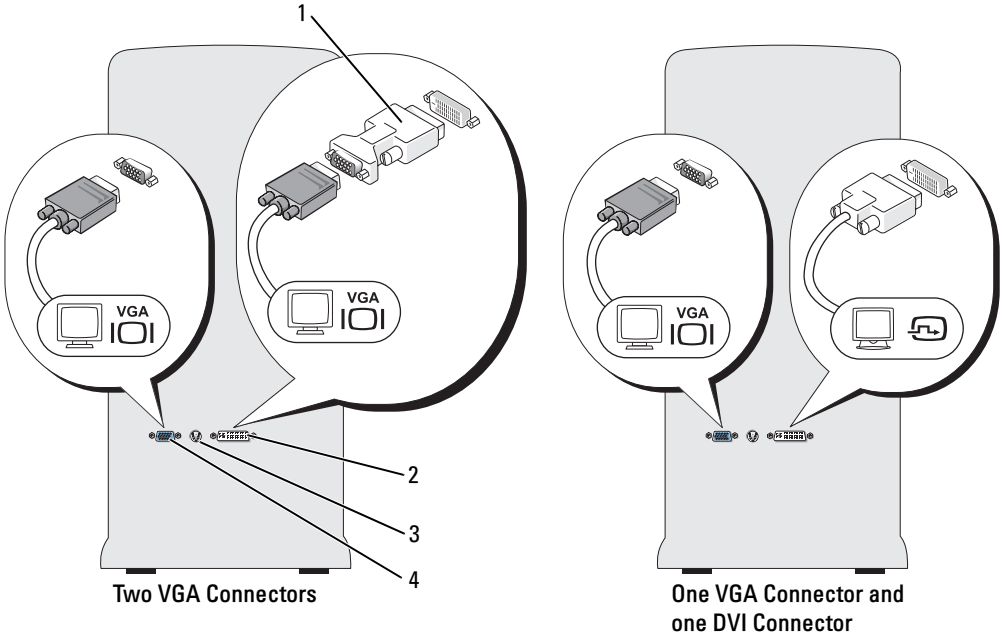
CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTE: Your computer supports one VGA and one DVI connector. If you are connecting two monitors that have VGA connectors, you must use the optional DVI-to-VGA adapter. If you are connecting two flat-panel monitors, at least one of them must have a VGA connector. If you are connecting a television, you can connect only one monitor (VGA or DVI) in addition to the television.

If you purchased a graphics card that supports dual monitors, follow these instructions to connect and enable your monitors. The instructions tell you how to connect two monitors with VGA connectors, one monitor with a VGA connector and one monitor with a DVI connector, or a television.

Connecting Two Monitors With VGA Connectors

1. Follow the procedures in "Before You Begin" on page 77.
2. Connect one of the monitors to the (blue) VGA connector on the back of the computer.
3. Connect the other monitor to the optional DVI-to-VGA adapter, then connect the adapter to the (white) DVI connector on the back of the computer.



1 optional DVI-to-VGA adapter 2 DVI connector (white) 3 TV-OUT connector

4 VGA connector (blue)

Connecting One Monitor With a VGA connector and One Monitor With a DVI Connector

1. Follow the procedures in "Before You Begin" on page 77.
2. Connect the VGA connector of the first monitor to the (blue) VGA connector on the back of the computer.
3. Connect the DVI connector of the second monitor to the (white) DVI connector on the back of the computer.

Connecting a Television (TV)

NOTE: See the documentation that came with your TV to ensure that you properly configure and connect the TV.

NOTE: To connect a TV to your computer, an S-video cable is required. If you do not have an S-video cable, you may purchase one at most consumer electronics stores. An S-video cable is not included with your computer.

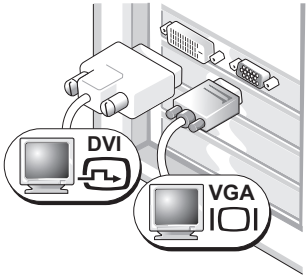
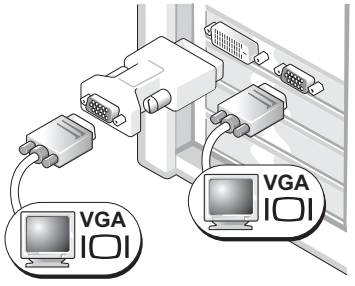
1. Follow the procedures in "Before You Begin" on page 77.
2. Connect one end of the S-video cable to the TV-OUT connector on the back of the computer.
3. Connect the other end of the S-video cable to the S-video input connector on your TV.
4. Connect a VGA or DVI monitor (see "Connecting Monitors" on page 17).

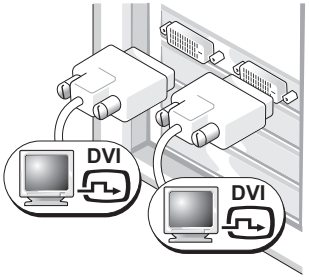
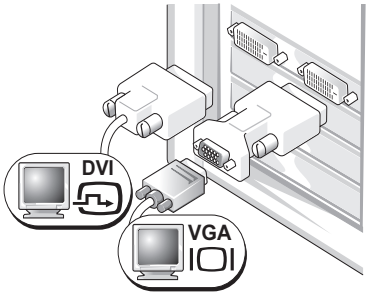
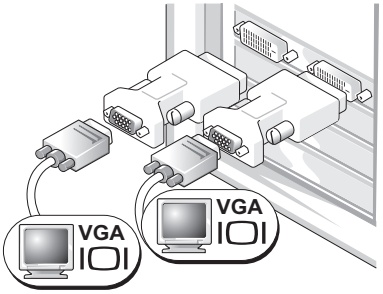
Changing the Display Settings

1. After you connect the monitor(s) or television, turn on the computer.

   The Microsoft® Windows® desktop displays on the primary monitor.
2. Enable clone mode or extended desktop mode in the display settings.
   - In clone mode, both monitors display the same image.
   - In extended desktop mode, you can drag objects from one screen to the other, effectively doubling the amount of viewable work space.

For information on changing the display settings for your graphics card, see the user's guide in the Help and Support Center (click the **Start** button, click **Help and Support**, click **User and system guides**, click **Device guides**, and then click the guide for your graphics card).

For dual-monitor capable cards with one DVI connector and one VGA connector	
One DVI connector and one VGA connector:	Two VGA connectors with one VGA adapter:
	
Use the appropriate connector(s) when you want to connect your computer to one or two monitors.	Use the DVI-to-VGA adapter when you want to connect your computer to two VGA monitors.

For dual-monitor capable cards with two DVI connectors		
Two DVI connectors:	Two DVI connectors with a DVI-to-VGA adapter:	Two DVI connectors with two DVI-to-VGA adapters:
		
Use the DVI connectors to connect your computer to one or two DVI monitors.	Use the DVI-to-VGA adapter to connect a VGA monitor to one of the DVI connectors on your computer	Use two DVI-to-VGA adapters to connect two VGA monitors to the DVI connectors on your computer.

Setting Up a Printer

NOTICE: Complete the operating system setup before you connect a printer to the computer.

See the documentation that came with the printer for setup information, including how to:

- Obtain and install updated drivers
- Connect the printer to the computer
- Load paper and install the toner or ink cartridge
- Contact the printer manufacturer for technical assistance

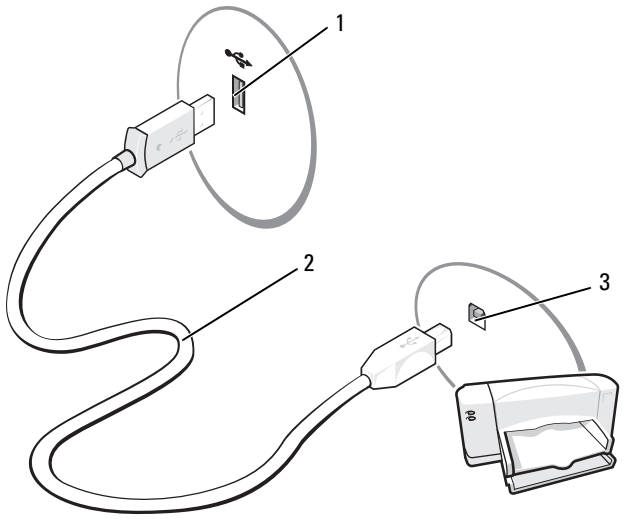
Printer Cable

Your printer connects to your computer with a USB cable. Your printer may not come with a printer cable, so if you purchase a cable separately, ensure that it is compatible with your printer. If you purchased a printer cable at the same time you purchased your computer, the cable may arrive in the computer box.

Connecting a USB Printer

NOTE: You can connect USB devices while the computer is turned on.

1. Complete the operating system setup, if you have not already done so.
2. Install the printer driver, if necessary (see the documentation that came with your printer).
3. Attach the USB printer cable to the appropriate USB connector on the computer and the printer. The connectors fit only one way.



1 USB connector on computer 2 USB printer cable 3 USB connector on printer

Connecting to the Internet

NOTE: ISPs and ISP offerings vary by country.

To connect to the Internet, you need a modem or network connection and an Internet service provider (ISP), such as AOL or MSN. Your ISP will offer one or more of the following Internet connection options:

- Dial-up connections that provide Internet access through a telephone line. Dial-up connections are considerably slower than DSL and cable modem connections.
- DSL connections that provide high-speed Internet access through your existing telephone line. With a DSL connection, you can access the Internet and use your telephone on the same line simultaneously.
- Cable modem connections that provide high-speed Internet access through your local cable TV line.

NOTE: If you use a dial-up connection, you need an add-in PCI modem expansion card.

If you are using a dial-up connection, connect a telephone line to the modem connector on your computer and to the telephone wall jack before you set up your Internet connection. If you are using a DSL or cable modem connection, contact your ISP for setup instructions.

Setting Up Your Internet Connection

To set up an AOL or MSN connection:

1. Save and close any open files, and exit any open programs.
2. Double-click the **MSN Explorer** or **AOL** icon on the Microsoft® Windows® desktop.
3. Follow the instructions on the screen to complete the setup.

If you do not have an **MSN Explorer** or **AOL** icon on your desktop, or if you want to set up an Internet connection with a different ISP:

1. Save and close any open files, and exit any open programs.
2. Click the **Start** button, then click **Internet Explorer**.

   The **New Connection Wizard** appears.
3. Click **Connect to the Internet**.
4. In the next window, click the appropriate option:
   - If you do not have an ISP and want to select one, click **Choose from a list of Internet service providers (ISPs)**.
   - If you have already obtained setup information from your ISP but you did not receive a setup CD, click **Set up my connection manually**.
   - If you have a CD, click **Use the CD I got from an ISP**.

   NOTE: If you do not know which type of connection to select, contact your ISP.
5. Click **Next**.

   If you selected **Set up my connection manually**, continue to step 6. Otherwise, follow the instructions on the screen to complete the setup.
6. Click the appropriate option under **How do you want to connect to the Internet?**, and then click **Next**.
7. Use the setup information provided by your ISP to complete the setup.

If you are having problems connecting to the Internet, see "E-Mail, Modem, and Internet Problems" on page 63. If you cannot connect to the Internet, but have successfully connected in the past, the ISP might have a service outage. Contact your ISP to check the service status, or try connecting again later.

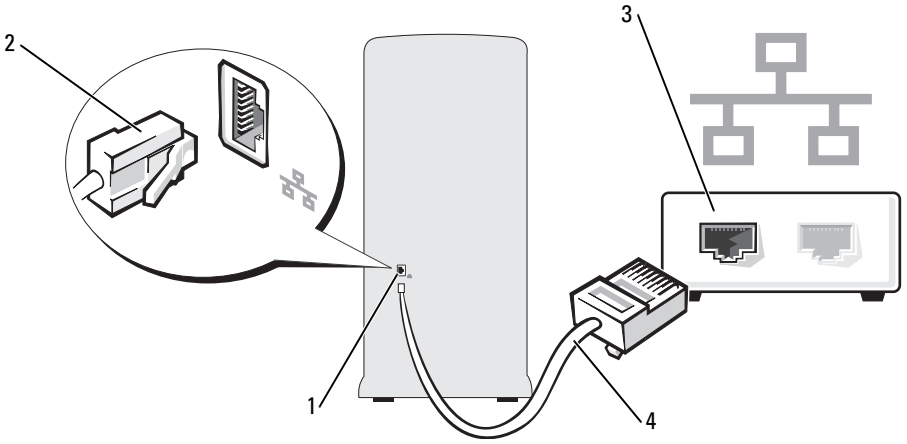
Setting Up a Home and Office Network

Connecting to a Network Adapter

NOTICE: Plug the network cable into the network adapter connector on the computer. Do not plug the network cable into the modem connector on the computer. Do not plug a network cable into a telephone wall jack.

1. Connect the network cable to the network adapter connector on the back of your computer.

   Insert the cable until it clicks into place, and then gently pull it to ensure that it is secure.
2. Connect the other end of the network cable to a network device.



1 network adapter connector on computer
2 network adapter connector
3 network device
4 network cable

Network Setup Wizard

The Microsoft® Windows® XP operating system provides a Network Setup Wizard to guide you through the process of sharing files, printers, or an Internet connection between computers in a home or small office.

1. Click the **Start** button, point to **All Programs→ Accessories→ Communications**, and then click **Network Setup Wizard**.
2. On the welcome screen, click **Next**.
3. Click **Checklist for creating a network**.

NOTE: Selecting the connection method **This computer connects directly to the Internet** enables the integrated firewall provided with Windows XP Service Pack.

4. Complete the checklist and required preparations.
5. Return to the **Network Setup Wizard** and follow the instructions on the screen.

Transferring Information to a New Computer

The Microsoft® Windows® XP operating system provides a **Files and Settings Transfer Wizard** to move data from a source computer to a new computer. You can transfer data, such as:

- E-mail messages
- Toolbar settings
- Window sizes
- Internet bookmarks

You can transfer the data to the new computer over a network, with an add in PS2/serial adapter (optional), or you can store it on a removable media, such as a writable CD or USB drive, for transfer to the new computer.

NOTE: You can transfer information from the old computer to the new computer by directly connecting a serial cable to the input/output (I/O) ports of the two computers. However, this requires that you install a PS2/serial adapter (optional), which provides a serial connector (COM). Also, the old computer needs to have a serial connector. To transfer data over a serial connection, you must access the Network Connections utility from the Control Panel and perform additional configuration steps, such as setting up an advanced connection and designating the host computer and the guest computer.

For instructions on setting up a direct cable connection between two computers, see Microsoft Knowledge Base Article #305621, titled *How to Set Up a Direct Cable Connection Between Two Computers in Windows XP*. This information may not be available in some countries.

For transferring information to a new computer, you must run the **Files and Settings Transfer Wizard**. You can use the optional *Operating System* CD for this process or you can create a wizard disk with the Files and Settings Transfer Wizard.

Running the Files and Settings Transfer Wizard With the Operating System CD

NOTE: This procedure requires the *Operating System* CD. This CD is optional and may not be included with all computers.

To prepare the new computer for the file transfer:

1. Start the **Files and Settings Transfer Wizard.**
2. When the **Files and Settings Transfer Wizard** welcome screen appears, click **Next**.
3. On the **Which computer is this?** screen, click **New Computer**, then click **Next**.
4. On the **Do you have a Windows XP CD?** screen, click **I will use the wizard from the Windows XP CD**, then click **Next**.
5. When the **Now go to your old computer** screen appears, go to your old or source computer. Do *not* click **Next** at this time.

To copy data from the old computer:

1. On the old computer, insert the Windows XP *Operating System* CD.
2. On the **Welcome to Microsoft Windows XP** screen, click **Perform additional tasks**.
3. Under **What do you want to do?**, click **Transfer files and settings**.
4. On the **Files and Settings Transfer Wizard** welcome screen, click **Next**.
5. On the **Which computer is this?** screen, click **Old Computer**, then click **Next**.
6. On the **Select a transfer method** screen, click the transfer method you prefer.

7 On the **What do you want to transfer?** screen, select the items you want to transfer, then click **Next**.

After the information has been copied, the **Completing the Collection Phase** screen appears.

8 Click **Finish**.

To transfer data to the new computer:

1 On the **Now go to your old computer** screen on the new computer, click **Next**.

2 On the **Where are the files and settings?** screen, select the method you chose for transferring your settings and files, then click **Next**.

The wizard reads the collected files and settings and applies them to your new computer.

When all of the settings and files have been applied, the **Finished** screen appears.

3 Click **Finished**, and then restart the new computer.

Running the Files and Settings Transfer Wizard Without the Operating System CD

To run the Files and Settings Transfer Wizard without the *Operating System* CD, you must create a wizard disk that will allow you to create a backup image file to removable media.

To create a wizard disk, use your new computer with Windows XP and perform the following steps:

1 Click the **Start** button.

2 Click **Files and Settings Transfer Wizard**.

3 When the **Files and Settings Transfer Wizard** welcome screen appears, click **Next**.

4 On the **Which computer is this?** screen, click **New Computer**, then click **Next**.

5 On the **Do you have a Windows XP CD?** screen, click **I want to create a Wizard Disk in the following drive:**, then click **Next.**

6 Insert the removable media, such as a writable CD, then click **OK**.

7 When the disk creation completes and the **Now go to your old computer** message appears, *do not* click **Next**.

8 Go to the old computer.

To copy data from the old computer:

1 On the old computer, insert the wizard disk.

2 Click the **Start** button, then click **Run**.

3 In the **Open** field on the **Run** window, browse to the path for **fastwiz** (on the appropriate removable media), then click **OK**.

4 On the **Files and Settings Transfer Wizard** welcome screen, click **Next**.

5 On the **Which computer is this?** screen, click **Old Computer**, then click **Next**.

6 On the **Select a transfer method** screen, click the transfer method you prefer.

7 On the **What do you want to transfer?** screen, select the items you want to transfer, then click **Next**.

After the information has been copied, the **Completing the Collection Phase** screen appears.

8 Click **Finish**.

To transfer data to the new computer:

1 On the **Now go to your old computer** screen on the new computer, click **Next**.

2 On the **Where are the files and settings?** screen, select the method you chose for transferring your settings and files, then click **Next**. Follow the instructions on the screen.

The wizard reads the collected files and settings and applies them to your new computer.

When all of the settings and files have been applied, the **Finished** screen appears.

3 Click **Finished**, and then restart the new computer.

NOTE: For more information about this procedure, search **support.dell.com** for document #PA1089586 (*How Do I Transfer Files From My Old Computer to My New Dell Computer Using the Microsoft® Windows® XP Operating System?*).

NOTE: Access to the Dell™ Knowledge Base document may not be available in some countries.

Playing CDs and DVDs

Playing a CD or DVD

NOTICE: Do not press down on the CD or DVD tray when you open or close it. Keep the tray closed when you are not using the drive.

NOTICE: Do not move or tilt the computer when you are playing CDs or DVDs.

1 Press the eject button on the front of the drive.

2 Place the disc, label side up, in the center of the tray.

3 Press the eject button or gently push on the tray to close it.

To format CDs for storing data, to create music CDs, or to copy CDs, see the CD software that came with your computer.

NOTE: Ensure that you observe all copyright laws when you create CDs or DVDs.

A CD player includes the following basic buttons:

	Play
	Move backward within the current track
	Pause
	Move forward within the current track
	Stop
	Go to the previous track
	Eject
	Go to the next track

A DVD player includes the following basic buttons:

	Stop
	Restart the current chapter
	Play
	Fast forward

	Pause
	Fast reverse
	Advance a single frame while in pause mode
	Go to the next title or chapter
	Continuously play the current title or chapter
	Go to the previous title or chapter
	Eject

For more information on playing CDs or DVDs, click **Help** on the CD or DVD player (if available).

Adjusting the Volume

NOTE: When the speakers are muted, you do not hear the CD or DVD playing.

1. Click the **Start** button, point to **All Programs**→ **Accessories**→ **Entertainment**, and then click **Volume Control**.
2. In the **Master Volume** control window, click and drag the bar in the **Master Volume** column and slide it up or down to increase or decrease the volume.

For more information on volume control options, click **Help** in the **Volume Control** window.

Adjusting the Picture

If an error message notifies you that the current resolution and color depth are using too much memory and preventing DVD playback, adjust the display properties.

1. Click the **Start** button, and then click **Control Panel**.
2. Under **Pick a category**, click **Appearance and Themes**.
3. Under **Pick a task...**, click **Change the screen resolution**.
4. In the **Display Properties** window, click and drag the bar in **Screen resolution** to change the setting to **800 by 600 pixels**.
5. Under **Color quality**, click the drop-down menu, and then click **Medium (16 bit)**.
6. Click **OK**.

Copying CDs and DVDs

NOTE: Ensure that you observe all copyright laws when creating CDs or DVDs.

This section applies only to computers that have a DVD+/-RW, or CD-RW/DVD (combo) drive.

NOTE: The types of CD or DVD drives offered by Dell may vary by country.

The following instructions explain how to make an exact copy of a CD or DVD using Roxio Creator Plus - Dell Edition. You can also use Roxio Creator Plus for other purposes, such as creating music CDs from audio files stored on your computer or backing up important data. For help, open Roxio Creator Plus, and then click the question mark icon in the upper-right corner of the window.

How to Copy a CD or DVD

NOTE: CD-RW/DVD combo drives cannot write to DVD media. If you have a CD-RW/DVD combo drive and you experience recording problems, check for available software patches on the Sonic support website at www.sonic.com.

The DVD-writable drives installed in Dell computers can write to and read DVD+/-R, DVD+/-RW and DVD+R DL (dual layer) media, but cannot write to and may not read DVD-RAM or DVD-R DL media.

NOTE: Most commercial DVDs have copyright protection and cannot be copied using Roxio Creator Plus.

1. Click the **Start** button, point to **All Programs→ Roxio→ Creator Projects**, and then click **RecordNow Copy**.
2. Under the **Copy** tab, click **Disc Copy**.
3. To copy the CD or DVD:
   - *If you have one CD/DVD drive*, ensure that the settings are correct and click the **Disc Copy** button. The computer reads your source CD or DVD and copies the data to a temporary folder on your computer hard drive.

     When prompted, insert a blank CD or DVD into the drive and click **OK**.
   - *If you have two CD/DVD drives*, select the drive into which you have inserted your source CD or DVD and click the **Disc Copy** button. The computer copies the data from the source CD or DVD to the blank CD or DVD.

   Once you have finished copying the source CD or DVD, the CD or DVD that you have created automatically ejects.

Using Blank CDs and DVDs

CD-RW drives can write to CD recording media only (including high-speed CD-RW media) while DVD-writable drives can write to both CD and DVD recording media.

Use blank CD-Rs to record music or permanently store data files. After the maximum storage capacity of a CD-R is reached, you cannot write to that CD-R again (see the Sonic documentation for more information). Use blank CD-RWs if you plan to erase, rewrite, or update information on the CD later.

Blank DVD+/-Rs can be used to permanently store large amounts of data. After you create a DVD+/-R disc, you may not be able to write to that disc again if the disc is *finalized* or *closed* during the final stage of the disc creation process. Use blank DVD+/-RWs if you plan to erase, rewrite, or update information on the disc later.

CD-Writable Drives

Media Type	Read	Write	Rewritable
CD-R	Yes	Yes	No
CD-RW	Yes	Yes	Yes

DVD-Writable Drives

Media Type	Read	Write	Rewritable
CD-R	Yes	Yes	No
CD-RW	Yes	Yes	Yes
DVD+R	Yes	Yes	No
DVD-R	Yes	Yes	No
DVD+RW	Yes	Yes	Yes
DVD-RW	Yes	Yes	Yes
DVD+R DL	Yes	Yes	No

Helpful Tips

- Use Microsoft® Windows® Explorer to drag and drop files to a CD-R or CD-RW only after you start Roxio Creator Plus and open a Creator project.
- Use CD-Rs to burn music CDs that you want to play in regular stereos. CD-RWs may not play in many home or car stereos.
- You cannot create audio DVDs with Roxio Creator Plus.
- Music MP3 files can be played only on MP3 players or on computers that have MP3 software installed.
- Commercially available DVD players used in home theater systems may not support all available DVD formats. For a list of formats supported by your DVD player, see the documentation provided with your DVD player or contact the manufacturer.
- Do not burn a blank CD-R or CD-RW to its maximum capacity; for example, do not copy a 650-MB file to a blank 650-MB CD. The CD-RW drive needs 1–2 MB of blank space to finalize the recording.
- Use a blank CD-RW to practice CD recording until you are familiar with CD recording techniques. If you make a mistake, you can erase the data on the CD-RW and try again. You can also use blank CD-RWs to test music file projects before you record the project permanently to a blank CD-R.
- See the Sonic website at **www.sonic.com** for additional information.

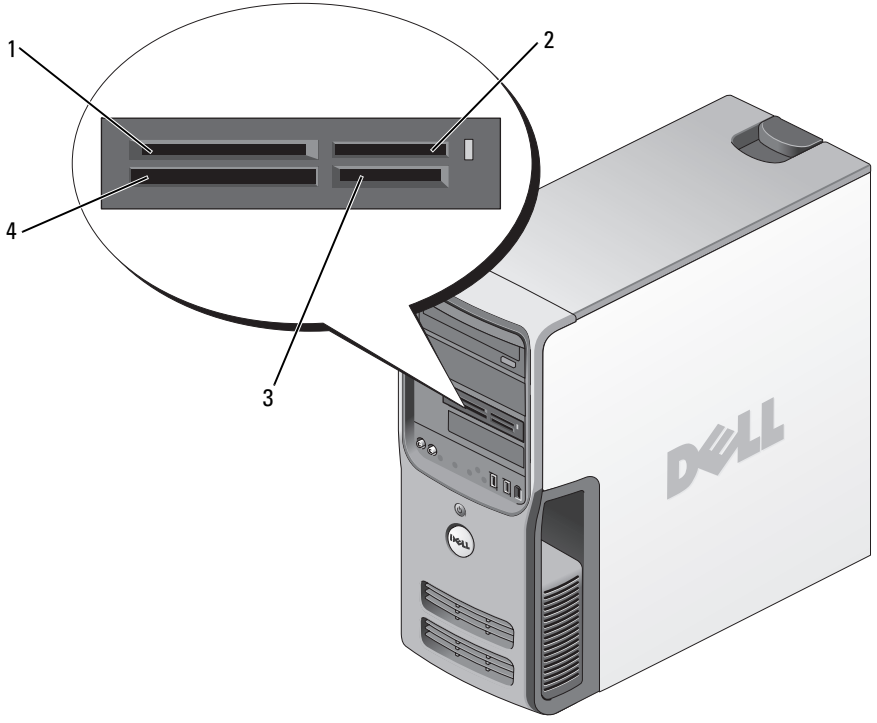
Using a Media Card Reader (Optional)

Use the Media Card Reader to transfer data directly to your computer.

The Media Card Reader supports the following memory types:

- xD-Picture Card
- SmartMedia (SMC)
- CompactFlash Type I and II (CF I/II)
- MicroDrive Card
- SecureDigital Card (SD)
- MultiMediaCard (MMC)
- Memory Stick (MS/MS Pro)

For information on installing a Media Card Reader, see "Installing a Media Card Reader" on page 115.



1	xD-Picture Card and SmartMedia (SMC)	2	Memory Stick (MS/MS Pro)	3	SecureDigital Card (SD) and MultiMediaCard (MMC)
4	CompactFlash Type I and II (CF I/II) and MicroDrive Card				

To use the Media Card Reader:

1. Check the media or card to determine the proper orientation for insertion.
2. Slide the media or card into the appropriate slot until it is completely seated in the connector.

   If you encounter resistance, do not force the media or card. Check the card orientation and try again.

IEEE 1394 (Optional)

IEEE 1394 is a digital interface that can move large amounts of data between computers and peripheral devices. IEEE 1394 is ideal for use with multimedia devices because it speeds the transfer of data and large files, which enables a computer to connect directly to devices such as digital video cameras.

NOTE: The connector can accept 4-pin IEEE 1394 devices with the use of an adapter.

Your computer may have an optional front IEEE 1394 connector. This connector is only available if you purchased an add-in card that uses IEEE 1394. To purchase a card, contact Dell.

Power Management

Overview

The Microsoft® Windows® XP power management features can reduce the amount of electricity your computer uses when it is on and you are not using it. You can reduce power to just the monitor or the hard drive, or you can use standby mode or hibernate mode to reduce power to the entire computer. When the computer exits from a power conservation mode, it returns to the operating state it was in prior to entering the mode.

NOTE: Windows XP Professional includes security and networking features not available in Windows XP Home Edition. When a Windows XP Professional computer is connected to a network, different options related to security and networking appear in certain windows.

NOTE: The procedures to activate the standby and hibernate modes may vary according to your operating system.

Standby Mode

Standby mode conserves power by turning off the display and the hard drive after a designated period of time, known as a time-out. When the computer exits from standby mode, it returns to the operating state it was in prior to entering standby mode.

NOTICE: If your computer loses power while in standby mode, it may lose data.

NOTICE: The graphics card in your computer is installed in the PCI Express x16 slot. When there is a card in this slot and you add a peripheral that does not support s3 suspend, your computer will not enter standby mode.

To set standby mode to automatically activate after a defined period of inactivity:

1. Click the **Start** button, then click **Control Panel**.
2. Define your standby settings on the **Power Schemes Tab** and **Advanced Tab**.

To immediately activate standby mode without a period of inactivity, click the **Start** button, click **Turn Off Computer**, and then click **Stand by**.

To exit from standby mode, press a key on the keyboard or move the mouse.

Hibernate Mode

Hibernate mode conserves power by copying system data to a reserved area on the hard drive, and then completely turning off the computer. When the computer exits from hibernate mode, the desktop is restored to the state it was in prior to entering hibernate mode.

To activate hibernate mode:

1. Click the **Start** button, then click **Control Panel**.
2. Define your hibernate settings on the **Power Schemes Tab, Advanced Tab** and **Hibernate Tab**.

To exit from hibernate mode**,** press the power button. The computer may take a short time to exit from hibernate mode. Because the keyboard and the mouse do not function when the computer is in hibernate mode, pressing a key on the keyboard or moving the mouse does not bring the computer out of hibernation.

Because hibernate mode requires a special file on your hard drive with enough disk space to store the contents of the computer memory, Dell creates an appropriately sized hibernate mode file before shipping the computer to you. If the computer's hard drive becomes corrupted, Windows XP recreates the hibernate file automatically.

Power Options Properties

Define your standby mode settings, hibernate mode settings, and other power settings in the **Power Options Properties** window. To access the **Power Options Properties** window:

1. Click the **Start** button, then click **Control Panel**.
2. Define your power settings on the **Power Schemes Tab, Advanced Tab** and **Hibernate Tab**.

Power Schemes Tab

Each standard power setting is called a scheme. If you want to select one of the standard Windows schemes installed on your computer, choose a scheme from the **Power schemes** drop-down menu. The settings for each scheme appear in the fields below the scheme name. Each scheme has different settings for starting standby mode, hibernate mode, turning off the monitor, and turning off the hard drive.

NOTICE: If you set the hard drive to time-out before the monitor does, your computer may appear to be locked up. To recover, press any key on the keyboard or click the mouse. To avoid this problem, always set the monitor to time-out before the hard drive.

The **Power schemes** drop-down menu displays the following schemes:

- **Always On** (default) — If you want to use your computer with no power conservation.
- **Home/Office Desk** — If you use your computer as a home or office computer and you require minimal power conservation.

- **Minimal Power Management** — If you want your computer to run with minimal power conservation.
- **Max Battery** — If your computer is a portable computer and you run your computer from batteries for extended periods of time.

If you want to change the default settings for a scheme, click the drop-down menu in the **Turn off monitor**, **Turn off hard disks**, **System stand by**, or **System hibernates** field, and then select a time-out from the displayed list. Changing the time-out for a scheme field permanently changes the default settings for that scheme, unless you click **Save As** and enter a new name for the changed scheme.

Advanced Tab

The **Advanced** tab allows you to:

- Place the power options icon in the Windows taskbar for quick access.
- Set the computer to prompt you for your Windows password before the computer exits from standby mode or hibernate mode.
- Program the power button to activate standby mode, activate hibernate mode, or turn off the computer.

To program these functions, click an option from the corresponding drop-down menu and click **OK**.

Hibernate Tab

The **Hibernate** tab allows you to enable hibernate mode. If you want to use the hibernate settings as defined on the **Power Schemes** tab, click the **Enable hibernate support** check box on the **Hibernate** tab.

For more information on power management options:

1. Click the **Start** button, then click **Help and Support**.
2. In the **Help and Support** window, click **Performance and maintenance**.
3. In the **Performance and maintenance** window, click **Conserving power on your computer**.

Cleaning Your Computer

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

Cleaning the Computer, Keyboard, and Monitor

CAUTION: Before you clean your computer, disconnect the computer from the electrical outlet. Clean your computer with a soft cloth dampened with water. Do not use liquid or aerosol cleaners, which may contain flammable substances.

- Use a vacuum cleaner with a brush attachment to gently remove dust from the slots and holes on your computer and from between the keys on the keyboard.

NOTICE: Do not wipe the display screen with any soap or alcohol solution. Doing so may damage the antiglare coating.

- To clean your monitor screen, lightly dampen a soft, clean cloth with water. If possible, use a special screen-cleaning tissue or solution suitable for the monitor's antistatic coating.
- Wipe the keyboard, computer, and plastic part of the monitor with a soft cleaning cloth moistened with a solution of three parts water and one part dishwashing detergent.

  Do not soak the cloth or let water drip inside your computer or keyboard.

Cleaning the Mouse

If your screen cursor skips or moves abnormally, clean the mouse. To clean a non-optical mouse:

1. Turn the retainer ring on the underside of your mouse counterclockwise, and then remove the ball.
2. Wipe the ball with a clean, lint-free cloth.
3. Blow carefully into the ball cage to dislodge dust and lint.
4. If the rollers inside the ball cage are dirty, clean the rollers with a cotton swab moistened lightly with isopropyl alcohol.
5. Recenter the rollers in their channels if they are misaligned. Ensure that fluff from the swab is not left on the rollers.
6. Replace the ball and retainer ring, and then turn the retainer ring clockwise until it clicks into place.

Cleaning the Floppy Drive

NOTICE: Do not attempt to clean drive heads with a swab. You might accidentally misalign the heads, which prevents the drive from operating.

Clean your floppy drive using a commercially available cleaning kit. These kits contain pretreated floppies to remove contaminants that accumulate during normal operation.

Cleaning CDs and DVDs

NOTICE: Always use compressed air to clean the lens in the CD/DVD drive, and follow the instructions that come with the compressed air. Never touch the lens in the drive.

If you notice problems, such as skipping, with the playback quality of your CDs or DVDs, try cleaning the discs.

1. Hold the disc by its outer edge. You can also touch the inside edge of the center hole.

NOTICE: To prevent damaging the surface, do not wipe in a circular motion around the disc.

2. With a soft, lint-free cloth, gently wipe the bottom of the disc (the unlabeled side) in a straight line from the center to the outer edge of the disc.

   For stubborn dirt, try using water or a diluted solution of water and mild soap. You can also purchase commercial products that clean discs and provide some protection from dust, fingerprints, and scratches. Cleaning products for CDs are safe to use on DVDs.

2

Optimizing Performance

Hyper-Threading

Hyper-Threading is an Intel® technology that can enhance overall computer performance by allowing one physical processor to function as two logical processors, capable of performing certain tasks simultaneously. It is recommended that you use the Microsoft® Windows® XP Service Pack 1 (SP1) or later operating system because Windows XP is optimized to take advantage of Hyper-Threading technology. While many programs can benefit from Hyper-Threading, some programs have not been optimized for Hyper-Threading and may require an update from the software manufacturer. Contact the software manufacturer for updates and information about using Hyper-Threading with your software.

To determine if your computer is using Hyper-Threading technology:

1. Click the **Start** button, right-click **My Computer**, and then click **Properties**.
2. Click **Hardware**, then click **Device Manager**.
3. In the **Device Manager** window, click the plus (+) sign next to **Processors**. If Hyper-Threading is enabled, the processor is listed twice.

You can enable or disable Hyper-Threading through system setup. For more information on accessing system setup, see "Entering System Setup" on page 127. For more information on Hyper-Threading, search the Knowledge Base on the Dell Support website at **support.dell.com**.

About Your RAID Configuration

This section provides an overview of the RAID configuration you may have selected when you purchased your computer. There are several RAID configurations are available in the computer industry for different types of uses. Your Dell Dimension™ computer supports RAID level 0 and RAID level 1. A RAID level 0 configuration is recommended for high-performance programs or gaming, and a RAID level 1 configuration is recommended for users that desire a high level of data integrity, such as that required in digital photography and audio.

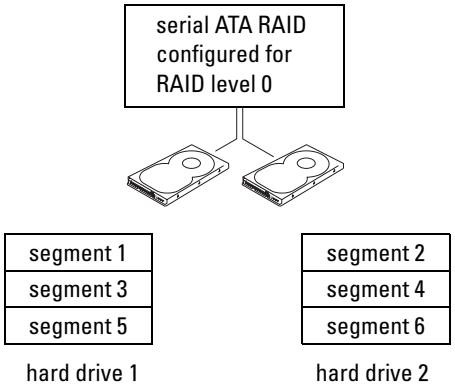
NOTE: RAID levels do not represent a hierarchy. A RAID level 1 configuration is not inherently better or worse than a RAID level 0 configuration.

The drives in a RAID configuration should be the same size in order to ensure that the larger drive does not contain unallocated (and therefore unusable) space.

RAID Level 0 Configuration

NOTICE: Because RAID level 0 configurations provide no data redundancy, a failure of one drive results in the loss of all data (the data on the remaining drive is also inaccessible). Therefore, ensure that you perform regular backups when you use a RAID level 0 configuration.

A RAID level 0 configuration uses a storage technique known as data striping to provide a high data access rate. Data striping is a method of writing consecutive segments, or stripes, of data sequentially across the physical drives to create a large virtual drive. Data striping allows one of the drives to read data while the other drive is searching for and reading the next block.

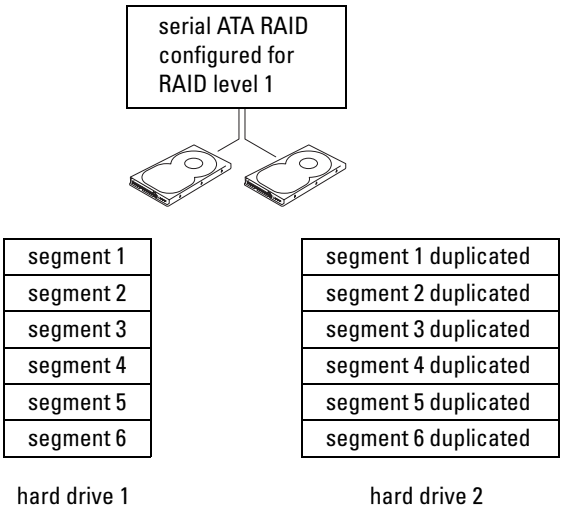


Another advantage of a RAID level 0 configuration is that it utilizes the full storage capacities of the drives. For example, two 120-GB drives combine to provide 240 GB of hard drive space on which to store data.

NOTE: In a RAID level 0 configuration, the size of the configuration is equal to the size of the smallest drive multiplied by the number of drives in the configuration.

RAID Level 1 Configuration

A RAID level 1 configuration uses a data-redundancy storage technique known as mirroring to enhance data integrity. When data is written to the primary drive, the data is also duplicated, or mirrored, on the second drive in the configuration. RAID level 1 sacrifices high data-access rates for its data redundancy advantages.



If a drive failure occurs, subsequent read and write operations are directed to the surviving drive. A replacement drive can then be rebuilt using the data from the surviving drive.

NOTE: In a RAID level 1 configuration, the size of the configuration is equal to the size of the smallest drive in the configuration.

Configuring Your Computer for RAID

Your computer can be configured for RAID, even if you did not select a RAID configuration when the computer was purchased. You must have at least two hard drives installed in your computer to set up a RAID configuration. For an explanation of RAID levels, see "About Your RAID Configuration" on page 37. For instructions on how to install a hard drive, see "Installing a Hard Drive" on page 106.

You can use one of two methods to configure RAID hard drive volumes. The first method uses the Intel® RAID Option ROM utility and is performed *before* you install the operating system onto the hard drive. The second method uses the Intel Matrix Storage Manager, or Intel Matrix Storage Console, and is performed *after* you have installed the operating system and the Intel Matrix Storage Console.

Both methods require that you set your computer to RAID-enabled mode before beginning any of the RAID configuration procedures in this document.

Setting Your Computer to RAID-Enabled Mode

1. Enter system setup (see "Entering System Setup" on page 127).
2. Press the up- and down-arrow keys to highlight **Drives**, then press <Enter>.
3. Press the up- and down-arrow keys to highlight **SATA Operation**, then press <Enter>.

4 Press the left- and right-arrow keys to highlight **RAID On**, press <Enter>, and then press <Esc>.

NOTE: For more information about RAID options, see "System Setup Options" on page 129.

5 Press the left- and right-arrow keys to highlight **Save/Exit**, and then press <Enter> to exit system setup and resume the boot process.

Using the Intel® RAID Option ROM Utility

NOTE: Hard drives of any size may be used to create a RAID configuration using the Intel RAID Option ROM utility. Ideally, however, the drives should be of equal size to avoid unallocated or unused space. For an explanation of RAID levels, see "About Your RAID Configuration" on page 37.

Creating a RAID Level 0 Configuration

NOTICE: The following procedure will result in the loss of all data on your hard drives. Back up any data you want to keep before continuing.

NOTE: Use the following procedure only if you are reinstalling your operating system. Do not use the following procedure to migrate an existing storage configuration to RAID level 0 configuration.

1 Set your computer to RAID-enabled mode (see "Setting Your Computer to RAID-Enabled Mode" on page 39).

2 Press <Ctrl><i> when you are prompted to enter the Intel® RAID Option ROM utility.

3 Press the up- and down-arrow keys to highlight **Create RAID Volume**, then press <Enter>.

4 Enter a RAID volume name or accept the default name, then press <Enter>.

5 Press the up- and down-arrow keys to select **RAID0 (Stripe)**, then press <Enter>.

6 If there are more than two hard drives available, press the up- and down-arrow keys and spacebar to select the two or three drives you want to use to make up your configuration, then press <Enter>.

NOTE: Select the strip size closest to the size of the average file you want to store on the RAID volume. If you do not know the average file size, choose 128 KB as your strip size.

7 Press the up- and down-arrow keys to change the strip size, then press <Enter>.

8 Select the desired capacity for the volume, then press <Enter>.

The default value is the maximum available size.

9 Press <Enter> to create the volume.

10 Press <y> to confirm that you want to create the RAID volume.

11 Confirm that the correct volume configuration is displayed on the main Intel® RAID Option ROM utility screen.

12 Press the up- and down-arrow keys to select **Exit**, and then press <Enter>.

13 Install the operating system (see "Using Microsoft Windows XP System Restore" on page 56).

Creating a RAID Level 1 Configuration

1. Set your computer to RAID-enabled mode (see "Setting Your Computer to RAID-Enabled Mode" on page 39).
2. Press <Ctrl><i> when you are prompted to enter the Intel RAID Option ROM utility.
3. Use the up- and down-arrow keys to highlight **Create RAID Volume**, then press <Enter>.
4. Enter a RAID volume name or accept the default name, then press <Enter>.
5. Use the up- and down-arrow keys to select **RAID1 (Mirror)**, then press <Enter>.
6. If there are more than two hard drives available, press the up- and down-arrow keys and spacebar to select the two drives you want to use to make up your volume, then press <Enter>.
7. Select the desired capacity for the volume, then press <Enter>.

   The default value is the maximum available size.
8. Press <Enter> to create the volume.
9. Press <y> to confirm that you want to create the RAID volume.
10. Confirm that the correct volume configuration is displayed on the main Intel RAID Option ROM utility screen.
11. Use the up- and down-arrow keys to select **Exit**, and then press <Enter>.
12. Install the operating system (see "Using Microsoft Windows XP System Restore" on page 56).

Deleting a RAID Volume

NOTICE: The following procedure will result in the loss of all data on the hard drives in your RAID configuration. Back up any data you want to keep before continuing.

NOTICE: If your computer currently boots to RAID and you delete the RAID volume in the Intel RAID Option ROM utility, your computer will become unbootable.

1. Press <Ctrl><i> when you are prompted to enter the Intel RAID Option ROM utility.
2. Use the up- and down-arrow keys to highlight **Delete RAID Volume**, then press <Enter>.
3. Use the up- and down-arrow keys to highlight the RAID volume you want to delete, then press <Delete>.
4. Press <y> to confirm the deletion of the RAID volume.
5. Press <Esc> to exit the Intel RAID Option ROM utility.

Using the Intel® Application Accelerator

If you already have one hard drive with the operating system installed on it, and you want to add a second hard drive then reconfigure both drives into a RAID volume without losing the existing operating system or data, use the migrating option (see "Migrating to a RAID Level 0 Configuration" on page 44 or "Migrating to a RAID Level 1 Configuration" on page 44). Create a RAID level 0 volume or RAID level 1 volume only when:

- You are adding two new drives to an existing single-drive computer (with the operating system installed on the single drive), and you want to configure the two new drives into a RAID volume.
- You already have a two-hard drive computer configured into a volume, but you still have some space left on the volume that you want to designate as a second RAID volume.

Creating a RAID Level 0 Configuration

NOTICE: The following procedure will result in the loss of all data on the hard drives in your RAID configuration. Back up any data you want to keep before continuing.

1. Set your computer to RAID-enabled mode (see "Setting Your Computer to RAID-Enabled Mode" on page 39).
2. Click **Start** and point to **Programs→ Intel(R) Application Accelerator→ Intel Matrix Storage Manager** to launch the Intel® Storage Utility.

   NOTE: If you do not see an **Actions** menu option, you have not yet set your computer to RAID-enabled mode (see "Setting Your Computer to RAID-Enabled Mode" on page 39).
3. On the **Actions** menu, select **Create RAID Volume** to launch the Create RAID Volume Wizard, then click **Next**.
4. On the **Select Volume Location** screen, click the first hard drive you want to include in your RAID level 0 volume, then click the right arrow.
5. Click to add a second hard drive, then click **Next**.

   To add a third hard drive in your RAID level 0 volume, click the right arrow and click on the third drive until three drives appear in the **Selected** window, and then click **Next**.
6. In the **Specify Volume Size** window, click the **Volume Size** desired, then click **Next**.
7. Click **Finish** to create the volume, or click **Back** to make changes.

Creating a RAID Level 1 Configuration

NOTICE: The following procedure will result in the loss of all data on the hard drives in your RAID configuration. Back up any data you want to keep before continuing.

1. Set your computer to RAID-enabled mode (see "Setting Your Computer to RAID-Enabled Mode" on page 39).
2. Click the **Start** button and point to **Programs→ Intel(R) Application Accelerator→ Intel Matrix Storage Manager** to launch the Intel® Storage Utility.

   NOTE: If you do not see an **Actions** menu option, you have not yet set your computer to RAID-enabled mode (see "Setting Your Computer to RAID-Enabled Mode" on page 39).
3. On the **Actions** menu, select **Create RAID Volume** to launch the Create RAID Volume Wizard.
4. Click **Next** at the first screen.
5. Confirm the volume name, select **RAID 1** as the RAID level, and then click **Next** to continue.
6. On the **Select Volume Location** screen, click the first hard drive you want to use to create your RAID level 0 volume, then click the right arrow. Click to add a second hard drive until two drives appear in the **Selected** window, and then click **Next**.
7. In the **Specify Volume Size** window, select the **Volume Size** desired, then click **Next**.
8. Click **Finish** to create the volume, or click **Back** to make changes.
9. Follow Microsoft Windows procedures for creating a partition on the new RAID volume.

Deleting a RAID Volume

NOTE: While this procedure deletes the RAID 1 volume, it also splits the RAID 1 volume into two non-RAID hard drives with a partition, and leaves any existing data files intact. Deleting a RAID 0 volume, however, destroys all data on the volume.

1. Click the **Start** button and point to **Programs→ Intel(R) Application Accelerator→ Intel Matrix Storage Manager** to launch the Intel® Storage Utility.
2. Right-click the **Volume** icon of the RAID volume you want to delete, then select **Delete Volume**.
3. On the **Delete RAID Volume Wizard** screen, click **Next**.
4. Highlight the RAID volume you want to delete in the **Available** box, click the right-arrow button to move the highlighted RAID volume into the **Selected** box, and then click **Next**.
5. Click **Finish** to delete the volume.

Migrating to a RAID Level 0 Configuration

1. Set your computer to RAID-enabled mode (see "Setting Your Computer to RAID-Enabled Mode" on page 39).
2. Click the **Start** button and point to **All Programs→ Intel(R) Application Accelerator→ Intel Matrix Storage Manager** to launch the Intel® Storage Utility.

   NOTE: If you do not see an **Actions** menu option, you have not yet set your computer to RAID-enabled mode (see "Setting Your Computer to RAID-Enabled Mode" on page 39).
3. On the **Actions** menu, select **Create RAID Volume From Existing Hard Drive** to launch the Migration Wizard.
4. Click **Next** on the Migration Wizard screen.
5. Enter a RAID volume name or accept the default name.
6. From the drop-down box, select **RAID 0** as the RAID level.
7. Select the appropriate strip size from the drop-down box, and then click **Next**.

   NOTE: Select the strip size closest to the size of the average file you want to store on the RAID volume. If you do not know the average file size, choose 128 KB as your strip size.
8. On the **Select Source Hard Drive** screen, double-click the hard drive from which you want to migrate, and click **Next**.

   NOTE: The source hard drive should be the hard drive containing the data or operating system files that you want to keep on the RAID volume.
9. On the **Select Member Hard Drive** screen, double-click the hard drive(s) to select the member drive(s) to span the stripe array, then click **Next**.
10. On the **Specify Volume Size** screen, select the **Volume Size** you want, then click **Next**.

NOTICE: The next step will result in the loss of all data on the member drive.

11. Click **Finish** to start migrating, or click **Back** to make changes. You can use your computer normally during the migration process.

Migrating to a RAID Level 1 Configuration

1. Set your computer to RAID-enabled mode (see "Setting Your Computer to RAID-Enabled Mode" on page 39).
2. Click the **Start** button and point to **All Programs→ Intel(R) Application Accelerator→ Intel Matrix Storage Manager** to launch the Intel® Storage Utility.

   NOTE: If you do not see an **Actions** menu option, you have not yet set your computer to RAID-enabled mode (see "Setting Your Computer to RAID-Enabled Mode" on page 39).
3. On the **Actions** menu, click **Create RAID Volume From Existing Hard Drive** to launch the Migration Wizard.
4. Click **Next** on the first Migration Wizard screen.

5 Enter a RAID volume name or accept the default name.

6 From the drop-down box, select **RAID 1** as the RAID level.

7 On the **Select Source Hard Drive** screen, double-click the hard drive from which you want to migrate, and click **Next**.

NOTE: The source hard drive should be the hard drive containing the data or operating system files that you want to keep on the RAID volume.

8 On the **Select Member Hard Drive** screen, double-click the hard drive to select the member drive that you want to act as the mirror in the configuration, then click **Next**.

9 On the **Specify Volume Size** screen, select the volume size you want, then click **Next**.

NOTICE: The next step will result in the loss of all data on the member drive.

10 Click **Finish** to start migrating, or click **Back** to make changes. You can use your computer normally during migration process.

Creating a Spare Hard Drive

A spare hard drive may be created with a RAID level 1 configuration. The spare hard drive will not be recognized by the operating system, but you will be able to see the spare drive from within Disk Manager or the Intel RAID Option ROM utility. When a member of the RAID level 1 configuration fails, the computer automatically rebuilds the mirror configuration using the spare hard drive as the failed member's replacement.

To mark a drive as a spare hard drive:

1 Click the **Start** button and point to **Programs→ Intel(R) Application Accelerator→ Intel Matrix Storage Manager** to launch the Intel® Storage Utility.

2 Right-click the hard drive you want to mark as a spare hard drive.

3 Click **Mark as Spare**.

To remove a drive as a spare hard drive:

1 Right-click the spare hard drive icon.

2 Click **Reset Hard Drive to Non-RAID**.

Rebuilding a Degraded RAID Level 1 Configuration

If your computer does not have a spare hard drive, and the computer has reported a degraded RAID level 1 volume, you can manually rebuild the computer's redundancy mirror to a new hard drive by performing the following steps:

1 Click the **Start** button and point to **Programs→ Intel(R) Application Accelerator→ Intel Matrix Storage Manager** to launch the Intel® Storage Utility.

2 Right-click the available hard drive to which you want to rebuild the RAID level 1 volume, then click **Rebuild to this Disk**.

You can use your computer while the computer is rebuilding the RAID level 1 volume.

Dell DataSafe (Optional)

Dell DataSafe is a solution to help you protect your data against unfortunate events such as data loss from system crashes, hard drive failures, software corruption, viruses, and other accidents. Using Intel technology, your computer has a robust level of data protection out of the factory. With Dell DataSafe, you will have a selected area on your system that automatically stores periodic copies of your computer's hard drive data. Not only does Dell DataSafe help you to store and protect your valuable data such as photos, music, videos, files, and more, it also helps restore your computer and your data in the event of a failure. The included software can give you the power to roll back your system to a healthy state after a system problem, easily retrieve deleted files, and recover individual files or an entire hard drive, and the Intel Matrix Storage Console (RAID) allows for continued functionality in the case of a single hard drive failure.

Intel® Viiv™ Technology (Optional)

Intel Viiv technology is a technology aimed at the digital home enthusiast that includes:

- A BIOS that supports Intel® Quick Resume Technology
- Device drivers

This technology allows the user's system to quickly return to an active state after non-use.

Intel Viiv technology is an option for systems that are ordered with Microsoft® Windows® XP Media Center Edition 2005 and dual core processors.

Using Intel® Viiv™ Quick Resume Technology (QRT)

When running in the Intel Viiv QRT mode, your power button is used as a quick on/off feature. Pressing the power button once causes the display to go blank and the audio to mute. In this mode, the computer is still operating as indicated by the power button indicator and diagnostic lights 1, 2, and 4 being lit. Also, you may notice that the hard drive indicator may blink when the hard drive is being accessed by an external device.

To resume normal computer operation, briefly press the power button, press any key on the keyboard, move the mouse, or press a button on the optional Microsoft® Windows® XP Media Center Edition 2005 remote control.

Enabling the QRT Feature in System Setup

The QRT drivers must be installed before the Quick Resume feature becomes active. The QRT drivers are installed when this option is ordered. Also, Quick Resume is enabled in system setup when this feature is ordered.

1. Enter system setup (see "Entering System Setup" on page 127).
2. Press the arrow keys to highlight the **Power Management** menu option, then press <Enter> to access the menu.
3. Press the up- and down-arrow keys to highlight the **Quick Resume** option, then press <Enter> to access the menu.
4. Press the left- and right-arrow keys to highlight the **On** option, and then press <Enter> to enable the Quick Resume feature.

Enabling the QRT Feature in the Operating system

1. Click the **Start** button, then click **Control Panel**.
2. Click the **Away** tab.
3. Ensure that the check boxes for **Enable away mode** and **Options** are checked.
4. Click the **Advanced** tab.
5. From the **When I press the power button on my computer** drop-down menu, select **Do Nothing**.
6. From the **When I press the sleep button on my computer** drop-down menu, select **Do Nothing**.

3

Troubleshooting Tools

Diagnostic Lights

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

To help you troubleshoot a problem, your computer has four lights labeled 1, 2, 3, and 4 on the front panel (see "Front View of the Computer" on page 13). When the computer starts normally, the lights flash before turning off. If the computer malfunctions, the sequence of the lights help to identify the problem.

Light Pattern	Problem Description	Suggested Resolution
	The computer is in a normal "off" condition or a possible pre-BIOS failure has occurred. All four diagnostic lights display solid green and then turn off after the system successfully boots to the operating system.	• Plug the computer into a working electrical outlet (see "Power Problems" on page 71). • If the problem persists, contact Dell (see "Contacting Dell" on page 137).
	A possible processor failure has occurred.	Contact Dell (see "Contacting Dell" on page 137).

Light Pattern	Problem Description	Suggested Resolution
	Memory modules are detected, but a memory failure has occurred.	• If two or more memory modules are installed, remove the modules (see "Removing Memory" on page 85), then reinstall one module (see "Installing Memory" on page 83) and restart the computer. If the computer starts normally, continue to install additional modules (one at a time) until you have identified a faulty module or reinstalled all modules without error. • If available, install properly working memory of the same type into your computer (see "Installing Memory" on page 83). • If the problem persists, contact Dell (see "Contacting Dell" on page 137).
	A possible graphics card failure has occurred.	• Reseat any installed graphics card (see "Cards" on page 86). • If available, install a working graphics card into your computer. • If the problem persists, contact Dell (see "Contacting Dell" on page 137).
	A possible floppy drive or hard drive failure has occurred.	Reseat all power and data cables.
	A possible USB failure has occurred.	Reinstall all USB devices and check all cable connections.

Light Pattern	Problem Description	Suggested Resolution
	No memory modules are detected.	• If two or more memory modules are installed, remove the modules (see "Removing Memory" on page 85), then reinstall one module (see "Installing Memory" on page 83) and restart the computer. If the computer starts normally, continue to install additional modules (one at a time) until you have identified a faulty module or reinstalled all modules without error. • If available, install properly working memory of the same type into your computer (see "Installing Memory" on page 83). • If the problem persists, contact Dell (see "Contacting Dell" on page 137).
	Memory modules are detected, but a memory configuration or compatibility error has occurred.	• Ensure that no special requirements for memory module/connector placement exist (see "Memory" on page 82). • Ensure that the memory you are using is supported by your computer (see "Memory" on page 123). • If the problem persists, contact Dell (see "Contacting Dell" on page 137).
	A possible expansion card failure has occurred.	**1** Determine if a conflict exists by removing a card (not a graphics card) and restarting the computer (see "Cards" on page 86). **2** If the problem persists, reinstall the card that you removed, then remove a different card and restart the computer. **3** Repeat this process for each card installed. If the computer starts normally, troubleshoot the last card removed from the computer for resource conflicts (see "Resolving Software and Hardware Incompatibilities" on page 56). **4** If the problem persists, contact Dell (see "Contacting Dell" on page 137).

Light Pattern	Problem Description	Suggested Resolution
	The system is operating in quick resume mode. See "Using Intel® Viiv™ Quick Resume Technology (QRT)" on page 46 for additional information.	• Press the power button • Move the mouse • Press any key on the keyboard • Press any key on the optional MCE remote control • If the problem persists, contact Dell (see "Contacting Dell" on page 137).
	Another failure has occurred.	• Ensure that all hard drive and CD/DVD cables are properly connected to the system board (see "System Board Components" on page 81). • If there is an error message on your screen identifying a problem with a device (such as the floppy drive or hard drive), check the device to ensure that it is functioning properly. • If the operating system is attempting to boot from a device (such as the floppy drive or hard drive), check system setup (see "System Setup" on page 127) to ensure the boot sequence is correct for the devices installed on your computer. • If the problem persists, contact Dell (see "Contacting Dell" on page 137).

Dell Diagnostics

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

If you experience a problem with your computer, perform the checks in "Solving Problems" on page 61 and run the Dell Diagnostics before you contact Dell for technical assistance.

NOTE: The Dell Diagnostics only operate on Dell computers.

1. Turn on (or restart) your computer.
2. When the DELL logo appears, press <F12> immediately.

   If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft® Windows® desktop, then shut down your computer and try again.
3. When the boot device list appears, highlight **Boot to Utility Partition**, then press <Enter>.
4. When the Dell Diagnostics **Main Menu** appears, select the test you want to run.

Dell Diagnostics Main Menu

1 After the Dell Diagnostics loads and the **Main Menu** screen appears, click the button for the option you want.

Option	Function
Express Test	Performs a quick test of devices. This test typically takes 10 to 20 minutes and requires no interaction on your part. Run **Express Test** first to increase the possibility of tracing the problem quickly.
Extended Test	Performs a thorough check of devices. This test typically takes 1 hour or more and requires you to answer questions periodically.
Custom Test	Tests a specific device. You can customize the tests you want to run.
Symptom Tree	Lists the most common symptoms encountered and allows you to select a test based on the symptom of the problem you are having.

2 If a problem is encountered during a test, a message appears with an error code and a description of the problem. Write down the error code and problem description and follow the instructions on the screen.

If you cannot resolve the error condition, contact Dell (see "Contacting Dell" on page 137).

NOTE: The Service Tag for your computer is located at the top of each test screen. When contacting Dell support, have your Service Tag ready.

3 If you run a test from the **Custom Test** or **Symptom Tree** option, click the applicable tab described in the following table for more information.

Tab	Function
Results	Displays the results of the test and any error conditions encountered.
Errors	Displays error conditions encountered, error codes, and the problem description.
Help	Describes the test and may indicate requirements for running the test.
Configuration	Displays your hardware configuration for the selected device. The Dell Diagnostics obtains configuration information for all devices from system setup, memory, and various internal tests, and displays the information in the device list in the left pane of the screen. The device list may not display the names of all the components installed on your computer or all devices attached to your computer.
Parameters	Allows you to customize the test by changing the test settings.

4 Close the test screen to return to the **Main Menu** screen. To exit the Dell Diagnostics and restart the computer, close the **Main Menu** screen.

Drivers

What Is a Driver?

A driver is a program that controls a device such as a printer, mouse, or keyboard. All devices require a driver program.

A driver acts like a translator between the device and any programs that use the device. Each device has its own set of specialized commands that only its driver recognizes.

Dell ships your computer to you with required drivers already installed—no further installation or configuration is needed.

Many drivers, such as the keyboard driver, come with your Microsoft® Windows® operating system. You may need to install drivers if you:

- Upgrade your operating system
- Reinstall your operating system
- Connect or install a new device

Identifying Drivers

If you experience a problem with any device, identify whether the driver is the source of your problem and, if necessary, update the driver.

Windows XP

1. Click **Start**, then click **Control Panel**.
2. Click **System**.
3. In the **System Properties** window, click the **Hardware** tab.
4. Click **Device Manager**.
5. Scroll down the list to see if any device has an exclamation point (a yellow circle with a [!]) on the device icon.

   If an exclamation point is next to the device name, you may need to reinstall the driver or install a new driver.

Reinstalling Drivers

NOTICE: The Dell Support website at **support.dell.com** provides approved drivers for Dell computers. If you install drivers obtained from other sources, your computer might not work correctly.

Using Windows XP Device Driver Rollback

If a problem occurs on your computer after you install or update a driver, use Windows XP Device Driver Rollback to replace the driver with the previously installed version.

1. Click **Start**, then click **Control Panel**.
2. Click **System**.
3. In the **System Properties** window, click the **Hardware** tab.
4. Click **Device Manager**.
5. Right-click the device for which the new driver was installed, then click **Properties**.
6. Click the **Drivers** tab.
7. Click **Roll Back Driver**.

If Device Driver Rollback does not resolve the problem, use System Restore to return your computer to the operating state that existed before you installed the new driver.

Manually Reinstalling Drivers

1. After copying the required driver files to your hard drive, click **Start**, and then right-click **My Computer**.
2. Click **Properties**.
3. Click the **Hardware** tab, then click **Device Manager**.
4. Double-click the type of device for which you are installing the driver.
5. Double-click the name of the device for which you are installing the driver.
6. Click the **Driver** tab, then click **Update Driver**.
7. Click **Install from a list or specific location (Advanced)**, then click **Next**.
8. Click **Browse** and browse to the location to which you previously extracted the driver files.
9. When the name of the appropriate driver appears, click **Next**.
10. Click **Finish**, and then restart your computer.

Resolving Software and Hardware Incompatibilities

If a device is not detected during the operating system setup or is detected but incorrectly configured, you can use the Hardware Troubleshooter to resolve the incompatibility.

To resolve incompatibilities using the Hardware Troubleshooter:

1. Click **Start**, then click **Help and Support**.
2. Type `hardware troubleshooter` in the **Search** field, then click the arrow to start the search.
3. Click **Hardware Troubleshooter** in the **Search Results** list.
4. In the **Hardware Troubleshooter** list, click **I need to resolve a hardware conflict on my computer**, and then click **Next**.

Restoring Your Operating System

You can restore your operating system in the following ways:

- Microsoft® Windows® XP System Restore returns your computer to an earlier operating state without affecting data files. Use System Restore as the first solution for restoring your operating system and preserving data files.
- Dell PC Restore by Symantec restores your hard drive to the operating state it was in when you purchased the computer. Dell PC Restore permanently deletes all data on the hard drive and removes any applications installed after you received the computer. Use PC Restore only if System Restore did not resolve your operating system problem.
- If you received an *Operating System* CD with your computer, you can use it to restore your operating system. However, using the *Operating System* CD also deletes all data on the hard drive. Use the CD *only* if System Restore did not resolve your operating system problem.

Using Microsoft Windows XP System Restore

The Microsoft Windows XP operating system provides System Restore to allow you to return your computer to an earlier operating state (without affecting data files) if changes to the hardware, software, or other system settings have left the computer in an undesirable operating state. See the Windows Help and Support Center for information on using System Restore. To access the Windows Help and Support Center:

1. Click **Start**→ **Help and Support**.
2. Type a word or phrase that describes your problem, then click the arrow icon.
3. Click the topic that describes your problem.
4. Follow the instructions on the screen.

NOTICE: Make regular backups of your data files. System Restore does not monitor your data files or recover them.

NOTE: The procedures in this document were written for the Windows default view and may not apply if you set your Dell computer to the Windows Classic view.

Creating a Restore Point

1. Click **Start**, then click **Help and Support**.
2. Click the task for **System Restore**.
3. Follow the instructions on the screen.

Restoring the Computer to an Earlier Operating State

If problems occur after you install a device driver, use Device Driver Rollback (see "Using Windows XP Device Driver Rollback" on page 55) to resolve the problem. If that is unsuccessful, use System Restore.

NOTICE: Before you restore the computer to an earlier operating state, save and close any open files and exit any open programs. Do not alter, open, or delete any files or programs until the system restoration is complete.

1. Click **Start**, point to **All Programs**→ **Accessories**→ **System Tools**, and then click **System Restore**.
2. Ensure that **Restore my computer to an earlier time** is selected, then click **Next**.
3. Click a calendar date to which you want to restore your computer.

   The **Select a Restore Point** screen provides a calendar that allows you to see and select restore points. All calendar dates with available restore points appear in boldface type.
4. Select a restore point, then click **Next**.

   If a calendar date has only one restore point, that restore point is automatically selected. If two or more restore points are available, click the restore point that you prefer.
5. Click **Next**.

   The **Restoration Complete** screen appears after System Restore finishes collecting data, then the computer restarts.
6. After the computer restarts, click **OK**.

To change the restore point, you can either repeat the steps using a different restore point, or you can undo the restoration.

Undoing the Last System Restore

NOTICE: Before you undo the last system restore, save and close all open files and exit any open programs. Do not alter, open, or delete any files or programs until the system restoration is complete.

1. Click **Start**, point to **All Programs**→ **Accessories**→ **System Tools**, and then click **System Restore**.
2. Click **Undo my last restoration**, and then click **Next**.

Enabling System Restore

If you reinstall Windows XP with less than 200 MB of free hard-disk space available, System Restore is automatically disabled. To see if System Restore is enabled:

1. Click **Start**, then click **Control Panel**.
2. Click **Performance and Maintenance**.Click **System**.

3 Click the **System Restore** tab.

4 Ensure that **Turn off System Restore** is unchecked.

Using Dell PC Restore by Symantec

NOTICE: Using Dell PC Restore permanently deletes all data on the hard drive and removes any applications or drivers installed after you received your computer. If possible, back up the data before using PC Restore. Use PC Restore only if System Restore did not resolve your operating system problem.

NOTE: Dell PC Restore by Symantec is not available in all countries or on all computers.

Use Dell PC Restore by Symantec only as the last method to restore your operating system.
PC Restore restores your hard drive to the operating state it was in when you purchased the computer. Any programs or files added since you received your computer—including data files—are permanently deleted from the hard drive. Data files include documents, spreadsheets, e-mail messages, digital photos, music files, and so on. If possible, back up all data before using PC Restore.

To use PC Restore:

1 Turn on the computer.

During the boot process, a blue bar with **www.dell.com** appears at the top of the screen.

2 Immediately, upon seeing the blue bar, press <Ctrl><F11>.

If you do not press <Ctrl><F11> in time, let the computer finish starting, then restart the computer again.

NOTICE: If you do not want to proceed with PC Restore, click **Reboot** in the following step.

3 On the next screen that appears, click **Restore**.

4 On the next screen, click **Confirm**.

The restore process takes approximately 6–10 minutes to complete.

5 When prompted, click **Finish** to reboot the computer.

NOTE: Do not manually shut down the computer. Click **Finish** and let the computer completely reboot.

6 When prompted, click **Yes**.

The computer restarts. Because the computer is restored to its original operating state, the screens that appear, such as the End User License Agreement, are the same ones that appeared the first time the computer was turned on.

7 Click **Next**.

The **System Restore** screen appears and the computer restarts.

8 After the computer restarts, click **OK**.

Removing Dell PC Restore

NOTICE: Removing Dell PC Restore from the hard drive permanently deletes the PC Restore utility from your computer. After you have removed Dell PC Restore, you will not be able to use it to restore your computer's operating system.

Dell PC Restore enables you to restore your hard drive to the operating state it was in when you purchased your computer. It is recommended that you *do not* remove PC Restore from your computer, even to gain additional hard-drive space. If you remove PC Restore from the hard drive, you can never recall it, and you will not be able to use PC Restore to return your computer's operating system to its original state.

1. Log on to the computer as a local administrator.
2. In Windows Explorer, go to **c:\dell\utilities\DSR**.
3. Double-click the filename **DSRIRRemv2.exe**.

   NOTE: If you do not log on as a local administrator, a message appears stating that you that you must log on as administrator. Click **Quit**, and then log on as a local administrator.

   NOTE: If the partition for PC Restore does not exist on your computer's hard drive, a message appears stating that the partition was not found. Click **Quit**; there is no partition to delete.
4. Click **OK** to remove the PC Restore partition on the hard drive.
5. Click **Yes** when a confirmation message appears.

   The PC Restore partition is deleted and the newly available disk space is added to the free space allocation on the hard drive.
6. Right-click **Local Disk (C)** in Windows Explorer, click **Properties** and verify that the additional disk space is available as indicated by the increased value for **Free Space**.
7. Click **Finish** to close the **PC Restore Removal** window.
8. Restart the computer.

4

Solving Problems

Troubleshooting Tips

Follow these tips when you troubleshoot your computer:

- If you added or removed a part before the problem started, review the installation procedures and ensure that the part is correctly installed.
- If a peripheral device does not work, ensure that the device is properly connected.
- If an error message appears on the screen, write down the exact message. This message may help support personnel diagnose and fix the problem(s).
- If an error message occurs in a program, see the program's documentation.
- If you cannot boot to your operating system after you have changed your SATA operation settings, restore your previous SATA operation settings and retry booting to the operating system.

Battery Problems

CAUTION: There is a danger of a new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

REPLACE THE BATTERY — If you have to repeatedly reset time and date information after turning on the computer, or if an incorrect time or date displays during start-up, replace the battery (see "Replacing the Battery" on page 120). If the battery still does not work properly, contact Dell (see "Contacting Dell" on page 137).

Drive Problems

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

ENSURE THAT MICROSOFT® WINDOWS® RECOGNIZES THE DRIVE — Click **Start**, then click **My Computer**. If the floppy, CD, or DVD drive, is not listed, perform a full scan with your antivirus software to check for and remove viruses. Viruses can sometimes prevent Windows from recognizing the drive.

TEST THE DRIVE —

- Insert another floppy, CD, or DVD to eliminate the possibility that the original is defective.
- Insert a bootable floppy and restart the computer.

CLEAN THE DRIVE OR DISK — See "Cleaning Your Computer" on page 34.

CHECK THE CABLE CONNECTIONS

RUN THE HARDWARE TROUBLESHOOTER — See "Using Microsoft Windows XP System Restore" on page 56.

RUN THE DELL DIAGNOSTICS — See "Dell Diagnostics" on page 52.

CD and DVD drive problems

NOTE: High-speed CD or DVD drive vibration is normal and may cause noise. This does not indicate a defect in the drive or the CD or DVD.

NOTE: Because of different regions worldwide and different disc formats, not all DVD titles work in all DVD drives.

ADJUST THE WINDOWS VOLUME CONTROL —

- Click the speaker icon in the lower-right corner of your screen.
- Ensure that the volume is turned up by clicking the slidebar and dragging it up.
- Ensure that the sound is not muted by clicking any boxes that are checked.

CHECK THE SPEAKERS AND SUBWOOFER — See "Sound and Speaker Problems" on page 73.

Problems writing to a CD/DVD-RW drive

CLOSE OTHER PROGRAMS — The CD/DVD-RW drive must receive a steady stream of data when writing. If the stream is interrupted, an error occurs. Try closing all programs before you write to the CD/DVD-RW.

TURN OFF STANDBY MODE IN WINDOWS BEFORE WRITING TO A CD/DVD-RW DISC — Search for the keyword *standby* in Windows Help.

Hard drive problems

RUN CHECK DISK —

1 Click **Start**, then click **My Computer**.
2 Right-click **Local Disk C:**.
3 Click **Properties**.
4 Click the **Tools** tab.
5 Under **Error-checking**, click **Check Now**.
6 Click **Scan for and attempt recovery of bad sectors**.
7 Click **Start**.

E-Mail, Modem, and Internet Problems

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTE: Connect the modem to an analog telephone jack only. The modem does not operate while it is connected to a digital telephone network.

CHECK THE MICROSOFT OUTLOOK® EXPRESS SECURITY SETTINGS — If you cannot open your e-mail attachments:

1 In Outlook Express, click **Tools**, click **Options**, and then click **Security**.
2 Click **Do not allow attachments** to remove the checkmark.

CHECK THE TELEPHONE LINE CONNECTION —
CHECK THE TELEPHONE JACK —
CONNECT THE MODEM DIRECTLY TO THE TELEPHONE WALL JACK —
USE A DIFFERENT TELEPHONE LINE —

- Verify that the telephone line is connected to the jack on the modem. (The jack has either a green label or a connector-shaped icon next to it.)
- Ensure that you feel a click when you insert the telephone line connector into the modem.
- Disconnect the telephone line from the modem and connect it to a telephone. Listen for a dial tone.
- If you have other telephone devices sharing the line, such as an answering machine, fax machine, surge protector, or line splitter, bypass them and use the telephone to connect the modem directly to the telephone wall jack. If you are using a line that is 3 m (10 ft) or more in length, try a shorter one.

RUN THE MODEM HELPER DIAGNOSTICS — Click **Start**, point to **All Programs**, and then click **Modem Helper**. Follow the instructions on the screen to identify and resolve modem problems. Modem Helper is not available on all computers.

VERIFY THAT THE MODEM IS COMMUNICATING WITH WINDOWS —

1. Click **Start**, then click **Control Panel**.
2. Click **Printers and Other Hardware**.
3. Click **Phone and Modem Options**.
4. Click the **Modems** tab.
5. Click the COM port for your modem.
6. Click **Properties**, click the **Diagnostics** tab, and then click **Query Modem** to verify that the modem is communicating with Windows.

   If all commands receive responses, the modem is operating properly.

ENSURE THAT YOU ARE CONNECTED TO THE INTERNET — Ensure that you have subscribed to an Internet provider. With the Outlook Express e-mail program open, click **File**. If **Work Offline** has a checkmark next to it, click the checkmark to remove it, then connect to the Internet. For help, contact your Internet service provider.

Error Messages

If the error message is not listed, see the documentation for the operating system or the program that was running when the message appeared.

A FILENAME CANNOT CONTAIN ANY OF THE FOLLOWING CHARACTERS: \ / : * ? " < > | — Do not use these characters in filenames.

A REQUIRED .DLL FILE WAS NOT FOUND — The program that you are trying to open is missing an essential file. To remove and then reinstall the program:

1. Click **Start**, click **Control Panel**, and then click **Add or Remove Programs**.
2. Select the program you want to remove.
3. Click the **Change or Remove Program** icon.
4. See the program documentation for installation instructions.

ALERT! AIR TEMPERATURE SENSOR NOT DETECTED — The ambient thermal sensor is not detected. Press **F1** to continue or **F2** to enter system setup.

***drive letter*:\ IS NOT ACCESSIBLE. THE DEVICE IS NOT READY** — The drive cannot read the disk. Insert a disk into the drive and try again.

INSERT BOOTABLE MEDIA — Insert a bootable floppy or CD.

NON-SYSTEM DISK ERROR — Remove the floppy from the drive and restart your computer.

NOT ENOUGH MEMORY OR RESOURCES. CLOSE SOME PROGRAMS AND TRY AGAIN — Close all windows and open the program that you want to use. In some cases, you may have to restart your computer to restore computer resources. If so, run the program that you want to use first.

OPERATING SYSTEM NOT FOUND — Contact Dell (see "Contacting Dell" on page 137).

Media Card Reader Problems

NO DRIVE LETTER IS ASSIGNED — When Microsoft Windows XP detects the Media Card Reader, the device is automatically assigned a drive letter as the next logical drive after all other physical drives in the system. If the next logical drive after the physical drives is mapped to a network drive, Windows XP does not automatically assign a drive letter to the Media Card Reader.

To manually assign a drive for the Media Card Reader:

1. Right-click My Computer and select **Manage**.
2. Select the **Disk Management** option.
3. Right-click the corresponding drive letter in the right pane that needs to be changed.
4. Select **Drive Letter and Paths.**
5. From the drop-down list, select the new drive letter assignment for the Media Card Reader.
6. Click **OK** to confirm your selection.

NOTE: The Media Card Reader appears as a mapped drive only when it is connected. Each of the four Media Card Reader slots are mapped to a drive even if no media is installed. If you attempt to access the Media Card Reader when no media is inserted, you are prompted to insert media.

FLEXBAY DEVICE IS DISABLED — There is a FlexBay disable option in the BIOS setup that appears only when the FlexBay device is installed. If the FlexBay device is physically installed, but it is not running, check to see if it is enabled in the BIOS setup.

Keyboard Problems

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CHECK THE KEYBOARD CABLE —

- Ensure that the keyboard cable is firmly connected to the computer.
- Shut down the computer (see "Turning Off Your Computer" on page 77), reconnect the keyboard cable as shown on the setup diagram for your computer, and then restart the computer.
- Ensure that the cable is not damaged or frayed, and check cable connectors for bent or broken pins. Straighten any bent pins.
- Remove any keyboard extension cables, and connect the keyboard directly to the computer.

TEST THE KEYBOARD — Connect a properly working keyboard to the computer, then try using the keyboard.

RUN THE HARDWARE TROUBLESHOOTER — See "Resolving Software and Hardware Incompatibilities" on page 56.

Lockups and Software Problems

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

The computer does not start up

CHECK THE DIAGNOSTIC LIGHTS — See "Diagnostic Lights" on page 49.

ENSURE THAT THE POWER CABLE IS FIRMLY CONNECTED TO THE COMPUTER AND TO THE ELECTRICAL OUTLET

The computer stops responding

NOTICE: You may lose data if you are unable to perform an operating system shutdown.

TURN THE COMPUTER OFF — If you are unable to get a response by pressing a key on your keyboard or moving your mouse, press and hold the power button for at least 8 to 10 seconds until the computer turns off, and then restart your computer.

A program stops responding

END THE PROGRAM —

1. Press <Ctrl><Shift><Esc> simultaneously.
2. Click **Applications**.
3. Click the program that is no longer responding.
4. Click **End Task**.

A program crashes repeatedly

NOTE: Most software includes installation instructions in its documentation or on a floppy disk or CD.

CHECK THE SOFTWARE DOCUMENTATION — If necessary, uninstall and then reinstall the program.

A program is designed for an earlier Windows operating system

RUN THE PROGRAM COMPATIBILITY WIZARD — The Program Compatibility Wizard configures a program so that it runs in an environment similar to non-Windows XP operating system environments.

1. Click **Start**, point to **All Programs**→ **Accessories**, and then click **Program Compatibility Wizard**.
2. In the welcome screen, click **Next**.
3. Follow the instructions on the screen.

A solid blue screen appears

TURN THE COMPUTER OFF — If you are unable to get a response by pressing a key on your keyboard or moving your mouse, press and hold the power button for at least 8 to 10 seconds until the computer turns off, and then restart your computer.

Other software problems

CHECK THE SOFTWARE DOCUMENTATION OR CONTACT THE SOFTWARE MANUFACTURER FOR TROUBLESHOOTING INFORMATION —

- Ensure that the program is compatible with the operating system installed on your computer.
- Ensure that your computer meets the minimum hardware requirements needed to run the software. See the software documentation for information.
- Ensure that the program is installed and configured properly.
- Verify that the device drivers do not conflict with the program.
- If necessary, uninstall and then reinstall the program.

BACK UP YOUR FILES IMMEDIATELY

USE A VIRUS-SCANNING PROGRAM TO CHECK THE HARD DRIVE, FLOPPY DISKS, OR CDS

SAVE AND CLOSE ANY OPEN FILES OR PROGRAMS AND SHUT DOWN YOUR COMPUTER THROUGH THE START MENU

Memory Problems

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

IF YOU RECEIVE AN INSUFFICIENT MEMORY MESSAGE —

- Save and close any open files and exit any open programs you are not using.
- See the software documentation for minimum memory requirements. If necessary, install additional memory (see "Installing Memory" on page 83).
- Reseat the memory modules (see "Memory" on page 82) to ensure that your computer is successfully communicating with the memory.
- Run the Dell Diagnostics (see "Dell Diagnostics" on page 52).

IF YOU EXPERIENCE OTHER MEMORY PROBLEMS —

- Reseat the memory modules (see "Memory" on page 82) to ensure that your computer is successfully communicating with the memory.
- Ensure that you are following the memory installation guidelines (see "Installing Memory" on page 83).
- Your computer supports DDR2 memory. For more information about the type of memory supported by your computer, see "Memory" on page 123.
- Run the Dell Diagnostics (see "Dell Diagnostics" on page 52).

Mouse Problems

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CLEAN THE MOUSE — For instructions on cleaning the mouse, see "Cleaning the Mouse" on page 35.

CHECK THE MOUSE CABLE —

1 Remove any mouse extension cables, and connect the mouse directly to the computer.

2 Verify that the mouse cable is connected as shown on the setup diagram for your computer.

RESTART THE COMPUTER —

1 Simultaneously press <Ctrl><Esc> to display the **Start** menu.

2 Press <u>, press the up- and down-arrow keys to highlight **Shut down** or **Turn Off**, and then press <Enter>.

3 After the computer turns off, reconnect the mouse cable as shown on the on the setup diagram for your computer.

4 Turn on the computer.

TEST THE MOUSE — Connect a properly working mouse to the computer, then try using the mouse.

CHECK THE MOUSE SETTINGS —

1 Click **Start**, click **Control Panel**, and then click **Printers and Other Hardware**.

2 Click **Mouse**.

3 Adjust the settings as needed.

REINSTALL THE MOUSE DRIVER — See "Reinstalling Drivers" on page 55.

RUN THE HARDWARE TROUBLESHOOTER — See "Resolving Software and Hardware Incompatibilities" on page 56.

Network Problems

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CHECK THE NETWORK CABLE CONNECTOR — Ensure that the network cable is firmly inserted into the network connector on the back of the computer and the network jack.

CHECK THE NETWORK LIGHTS ON THE BACK OF THE COMPUTER — If the link integrity light is off, no network communication exists. Replace the network cable. For a description of network lights, see "Controls and Lights" on page 126.

RESTART THE COMPUTER AND LOG ON TO THE NETWORK AGAIN

CHECK YOUR NETWORK SETTINGS — Contact your network administrator or the person who set up your network to verify that your network settings are correct and that the network is functioning.

RUN THE HARDWARE TROUBLESHOOTER — See "Resolving Software and Hardware Incompatibilities" on page 56.

Power Problems

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

IF THE POWER LIGHT IS GREEN AND THE COMPUTER IS NOT RESPONDING — See "Dell Diagnostics" on page 52.

IF THE POWER LIGHT IS BLINKING GREEN — The computer is in standby mode. Press a key on the keyboard, move the mouse, or press the power button to resume normal operation.

IF THE POWER LIGHT IS OFF — The computer is either turned off or is not receiving power.

- Reseat the power cable into the power connector on the back of the computer and the electrical outlet.
- If the computer is plugged into a power strip, ensure that the power strip is plugged into an electrical outlet and that the power strip is turned on.
- Bypass power protection devices, power strips, and power extension cables to verify that the computer turns on properly.
- Ensure that the electrical outlet is working by testing it with another device, such as a lamp.
- Ensure that the main power cable and front panel cable are securely connected to the system board (see "System Board Components" on page 81).

IF THE POWER LIGHT IS STEADY AMBER — A device may be malfunctioning or incorrectly installed.

- Remove and then reinstall the memory modules (see "Memory" on page 82).
- Remove and then reinstall any cards, including graphics cards (see "Cards" on page 86).

IF THE POWER LIGHT IS BLINKING AMBER — The computer is receiving electrical power, but an internal power problem may exist.

- Ensure that the voltage selection switch is set to match the AC power at your location, if applicable.
- Ensure that the processor power cable is securely connected to the system board (see "System Board Components" on page 81).

ELIMINATE INTERFERENCE — Some possible causes of interference are:

- Power, keyboard, and mouse extension cables
- Too many devices connected to the same power strip
- Multiple power strips connected to the same electrical outlet

Printer Problems

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTE: If you need technical assistance for your printer, contact the printer's manufacturer.

CHECK THE PRINTER DOCUMENTATION — See the printer documentation for setup and troubleshooting information.

ENSURE THAT THE PRINTER IS TURNED ON

CHECK THE PRINTER CABLE CONNECTIONS —

- See the printer documentation for cable connection information.
- Ensure that the printer cables are securely connected to the printer and the computer (see "Setting Up a Printer" on page 20).

TEST THE ELECTRICAL OUTLET — Ensure that the electrical outlet is working by testing it with another device, such as a lamp.

VERIFY THAT THE PRINTER IS RECOGNIZED BY WINDOWS —

1 Click **Start**, click **Control Panel**, and then click **Printers and Other Hardware**.
2 Click **View installed printers or fax printers**.
If the printer is listed, right-click the printer icon.
3 Click **Properties**, then click the **Ports** tab. For a USB printer, ensure that **Print to the following port(s):** is set to **USB**.

REINSTALL THE PRINTER DRIVER — See the printer documentation for instructions.

Scanner Problems

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTE: If you need technical assistance for your scanner, contact the scanner's manufacturer.

CHECK THE SCANNER DOCUMENTATION — See the scanner documentation for setup and troubleshooting information.

UNLOCK THE SCANNER — Ensure that your scanner is unlocked (if the scanner has a locking tab or button).

RESTART THE COMPUTER AND TRY THE SCANNER AGAIN

CHECK THE CABLE CONNECTIONS —

- See the scanner documentation for cable connection information.
- Ensure that the scanner cables are securely connected to the scanner and the computer.

VERIFY THAT THE SCANNER IS RECOGNIZED BY MICROSOFT WINDOWS —

1 Click **Start**, click **Control Panel**, and then click **Printers and Other Hardware**.

2 Click **Scanners and Cameras**.

If your scanner is listed, Windows recognizes the scanner.

REINSTALL THE SCANNER DRIVER — See the scanner documentation for instructions.

Sound and Speaker Problems

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

No sound from speakers

NOTE: The volume control in MP3 and other media players may override the Windows volume setting. Always check to ensure that the volume on the media player(s) has not been turned down or off.

CHECK THE SPEAKER CABLE CONNECTIONS — Ensure that the speakers are connected as shown on the setup diagram supplied with the speakers. If you purchased a sound card, ensure that the speakers are connected to the card.

ENSURE THAT THE SUBWOOFER AND THE SPEAKERS ARE TURNED ON — See the setup diagram supplied with the speakers. If your speakers have volume controls, adjust the volume, bass, or treble to eliminate distortion.

ADJUST THE WINDOWS VOLUME CONTROL — Click or double-click the speaker icon in the lower-right corner of your screen. Ensure that the volume is turned up and that the sound is not muted.

DISCONNECT HEADPHONES FROM THE HEADPHONE CONNECTOR — Sound from the speakers is automatically disabled when headphones are connected to the computer's front-panel headphone connector.

TEST THE ELECTRICAL OUTLET — Ensure that the electrical outlet is working by testing it with another device, such as a lamp.

ELIMINATE POSSIBLE INTERFERENCE — Turn off nearby fans, fluorescent lights, or halogen lamps to check for interference.

REINSTALL THE SOUND DRIVER — See "Reinstalling Drivers" on page 55.

RUN THE HARDWARE TROUBLESHOOTER — See "Resolving Software and Hardware Incompatibilities" on page 56.

No sound from headphones

CHECK THE HEADPHONE CABLE CONNECTION — Ensure that the headphone cable is securely inserted into the headphone connector (see "Front View of the Computer" on page 13).

ADJUST THE WINDOWS VOLUME CONTROL — Click or double-click the speaker icon in the lower-right corner of your screen. Ensure that the volume is turned up and that the sound is not muted.

Video and Monitor Problems

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTE: See the monitor documentation for troubleshooting procedures.

The screen is blank

CHECK THE MONITOR CABLE CONNECTION —

- Ensure that the monitor cable is connected as shown on the setup diagram for your computer.
- Remove any video extension cables and connect the monitor directly to the computer.
- Swap the computer and monitor power cables to determine if the power cable is defective.
- Check the connectors for bent or broken pins (it is normal for monitor cable connectors to have missing pins).

CHECK THE MONITOR POWER LIGHT —

- If the power light is off, firmly press the button to ensure that the monitor is turned on.
- If the power light is lit or blinking, the monitor has power.
- If the power light is blinking, press a key on the keyboard or move the mouse to resume normal operation.

TEST THE ELECTRICAL OUTLET — Ensure that the electrical outlet is working by testing it with another device, such as a lamp.

CHECK THE DIAGNOSTIC LIGHTS — See "Diagnostic Lights" on page 49.

The screen is difficult to read

CHECK THE MONITOR SETTINGS — See the monitor documentation for instructions on adjusting the contrast and brightness, demagnetizing (degaussing) the monitor, and running the monitor self-test.

MOVE THE SUBWOOFER AWAY FROM THE MONITOR — If your speaker system includes a subwoofer, ensure that the subwoofer is at least 60 cm (2 ft) away from the monitor.

MOVE THE MONITOR AWAY FROM EXTERNAL POWER SOURCES — Fans, fluorescent lights, halogen lamps, and other electrical devices can cause the screen image to appear "shaky." Turn off nearby devices to check for interference.

ROTATE THE MONITOR TO ELIMINATE SUNLIGHT GLARE AND POSSIBLE INTERFERENCE

ADJUST THE WINDOWS DISPLAY SETTINGS —

1 Click **Start**, click **Control Panel**, and then click **Appearance and Themes**.
2 Click **Display**, then click the **Settings** tab.
3 Adjust **Screen resolution** and **Color quality** settings, as needed.

5

Removing and Installing Parts

Before You Begin

This chapter provides procedures for removing and installing the components in your computer. Unless otherwise noted, each procedure assumes that the following conditions exist:

- You have performed the steps in "Turning Off Your Computer" on page 77 and "Before Working Inside Your Computer" on page 78.
- You have read the safety information in your Dell™ *Product Information Guide*.
- A component can be replaced by performing the removal procedure in reverse order.

Recommended Tools

The procedures in this document may require the following tools:

- Small flat-blade screwdriver
- Phillips screwdriver
- Flash BIOS update program (download from **support.dell.com**)

Turning Off Your Computer

NOTICE: To avoid losing data, save and close any open files and exit any open programs before you turn off your computer.

1. Shut down the operating system:
   a. Save and close any open files, exit any open programs, click **Start**, and then click **Turn Off Computer**.
   b. In the **Turn off computer** window, click **Turn off**.

      The computer turns off after the operating system shutdown process finishes.
2. Ensure that the computer and any attached devices are turned off. If your computer and attached devices did not automatically turn off when you shut down your operating system, press and hold the power button for 4 seconds.

Before Working Inside Your Computer

Use the following safety guidelines to help protect your computer from potential damage and to help ensure your own personal safety.

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: Handle components and cards with care. Do not touch the components or contacts on a card. Hold a card by its edges or by its metal mounting bracket. Hold a component such as a processor by its edges, not by its pins.

CAUTION: When working inside the computer, be aware that the processor heat-sink assembly, power supply, graphics card, and other components may be very hot during normal operation. Be sure that they have sufficient time to cool before you touch them.

NOTICE: Only a certified service technician should perform repairs on your computer. Damage due to servicing that is not authorized by Dell is not covered by your warranty.

NOTICE: When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs; if you are disconnecting this type of cable, press in on the locking tabs before you disconnect the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before you connect a cable, ensure that both connectors are correctly oriented and aligned.

NOTICE: To avoid damaging the computer, perform the following steps before you begin working inside the computer.

1. Turn off your computer (see "Turning Off Your Computer" on page 77).

NOTICE: To disconnect a network cable, first unplug the cable from your computer and then unplug it from the network wall jack.

2. Disconnect any telephone or telecommunication lines from the computer.
3. Disconnect your computer and all attached devices from their electrical outlets, and then press the power button to ground the system board.

NOTICE: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate any static electricity that could harm internal components.

Removing the Computer Cover

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

NOTICE: Before touching anything inside your computer, ground yourself by touching an unpainted metal surface, such as the metal at the back of the computer. While you work, periodically touch an unpainted metal surface to dissipate any static electricity that could harm internal components.

1 Follow the procedures in "Before You Begin" on page 77.

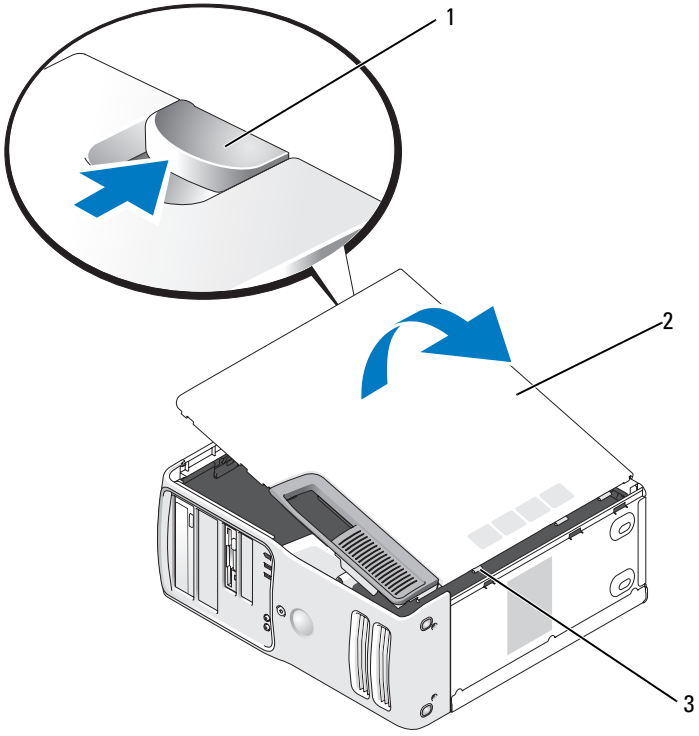
2 If you have installed a security cable, remove it from the security cable slot.

NOTICE: Ensure that sufficient space exists to support the removed cover—at least 30 cm (1 ft) of desk top space.

NOTICE: Ensure that you are working on a level, protected surface to avoid scratching either the computer or the surface on which it is resting.

3 Lay your computer on its side with the computer cover facing up.

4 Pull back the cover release latch on the top panel.



1 cover release latch 2 computer cover 3 hinge tabs (3)

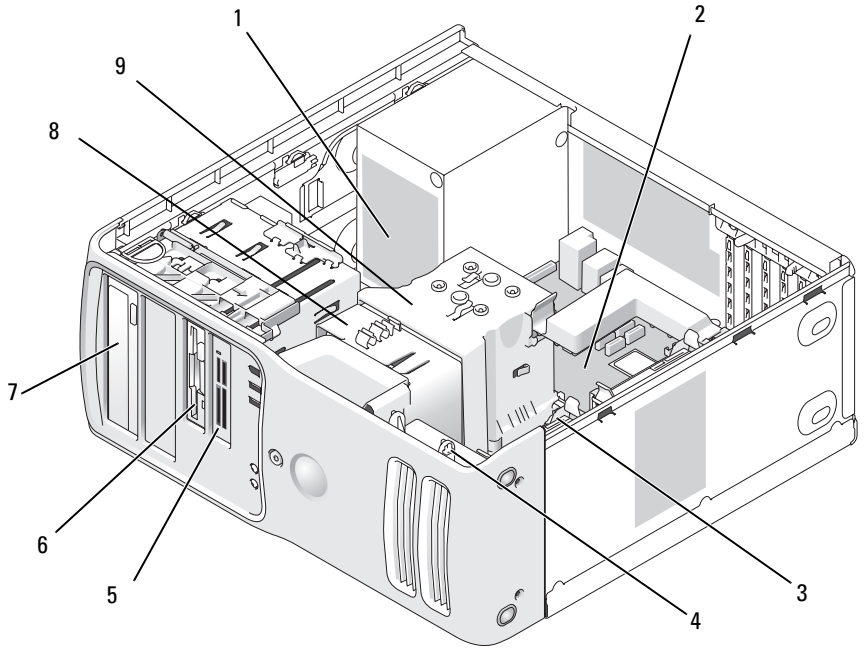
5 Locate the three hinge tabs on the bottom edge of the computer.

6 Grip the sides of the computer cover and pivot the cover up.

7 Lift the cover away and set it aside in a secure location.

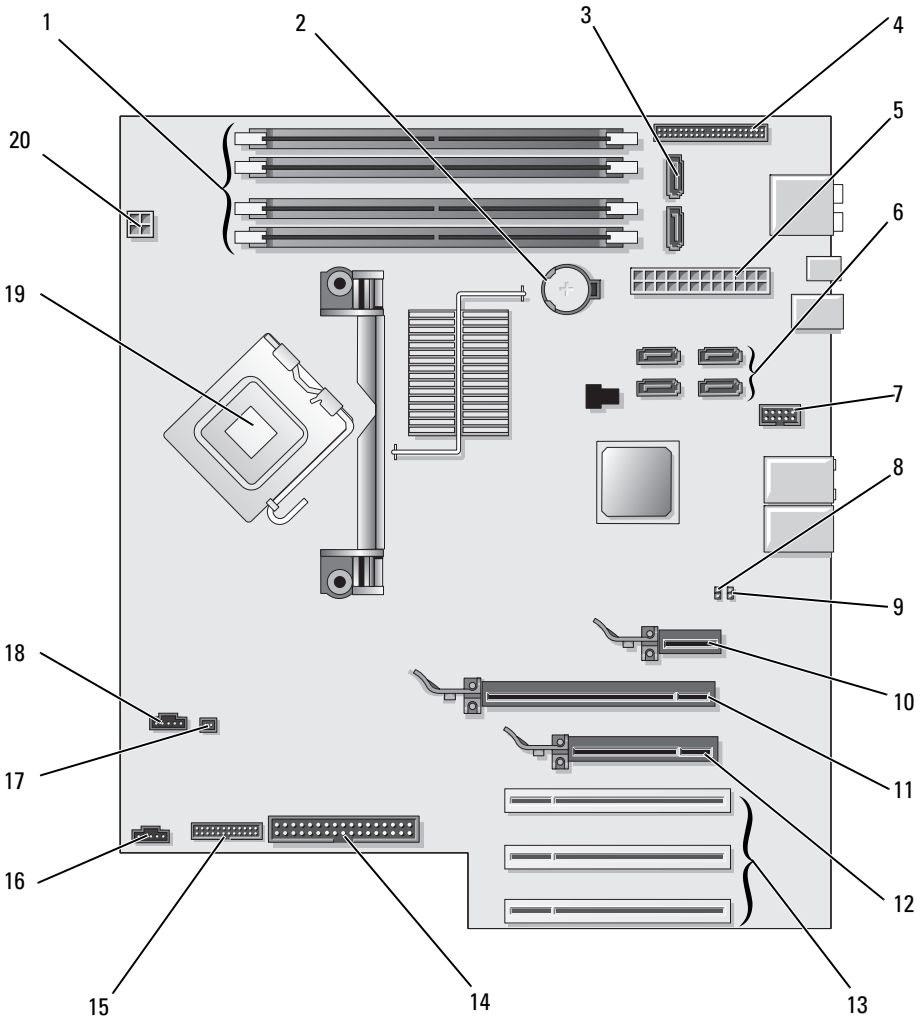
Inside View of Your Computer

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.



1	power supply	2	system board	3	hard drive
4	card fan	5	media card reader (optional)	6	floppy drive (optional)
7	CD or DVD drive	8	processor fan	9	processor shroud and processor

System Board Components



1	memory module connectors (1, 2, 3, 4)	2	battery socket (BATTERY)	3	SATA Connectors SATA0, SATA1)
4	front panel I/O connector	5	main power connector	6	SATA connectors (4) (SATA2, SATA3, SATA4, SATA5
7	FlexBay USB connector	8	clear CMOS jumper (CLRCMOS)	9	password jumper (CLRPSWD)

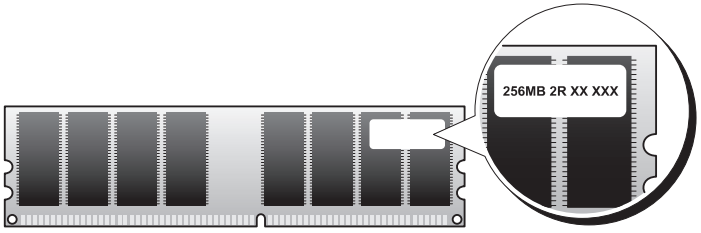
10	PCI Express x1 card connector	11	PCI Express x16 card connector	12	PCI Express x4 card connector
13	PCI card connectors	14	floppy drive connector (FLOPPY)	15	PS/2 and Serial connector
16	rear fan connector	17	thermal sensor connector	18	CPU fan connector
19	processor and heat sink connector	20	processor power connector		

Memory

You can increase your computer memory by installing memory modules on the system board. For information on the type of memory supported by your computer, see "Memory" on page 123.

Memory Overview

- Memory modules should be installed in *pairs of matched memory size, speed, and technology.* If the memory modules are not installed in matched pairs, the computer will continue to operate, but with a slight reduction in performance. See the label in the upper-right corner of the module to determine the module's capacity.



NOTE: Always install memory modules in the order indicated on the system board.

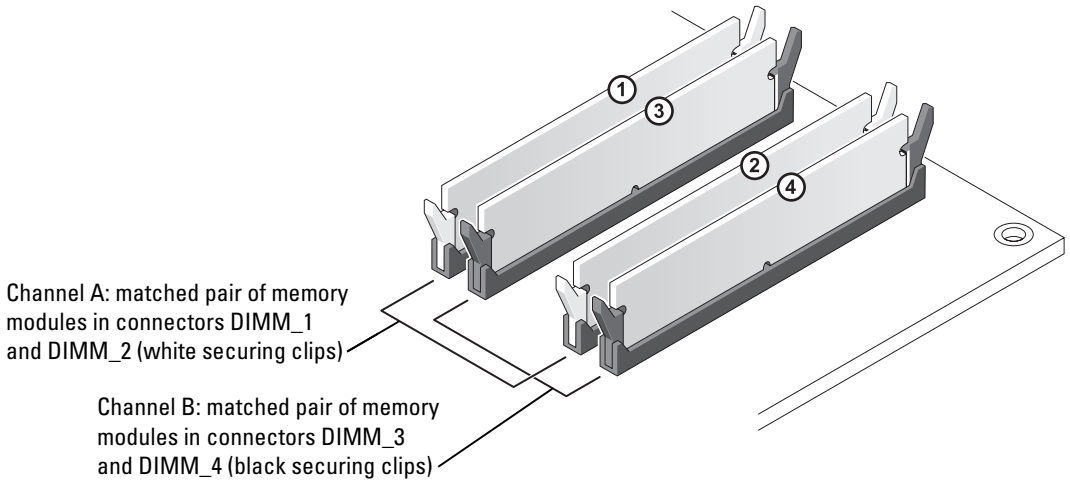
The recommended memory configurations are:

– A pair of matched memory modules installed in connectors DIMM_1 and DIMM_2

or

– A pair of matched memory modules installed in connectors DIMM_1 and DIMM_2 and another matched pair installed in connectors DIMM_3 and DIMM_4

- If you install mixed pairs of DDR2 533-MHz (PC2-4300), DDR2 667-MHz (PC2-5300), and DDR2 800-MHz (PC2-6400) memory, the modules function at the slowest speed installed.
- Be sure to install a single memory module in the DIMM_1 connector, the connector closest to the processor, before you install modules in the other connectors.
- While installing memory modules, ensure that you do not mix ECC and non-ECC memory.


1
3
2
4
Channel A: matched pair of memory modules in connectors DIMM_1 and DIMM_2 (white securing clips)
Channel B: matched pair of memory modules in connectors DIMM_3 and DIMM_4 (black securing clips)

NOTE: Memory purchased from Dell is covered under your computer warranty.

NOTICE: If you remove your original memory modules from the computer during a memory upgrade, keep them separate from any new modules that you may have, even if you purchased the new modules from Dell. If possible, *do not* pair an original memory module with a new memory module. Otherwise, your computer may not start properly. You should install your original memory modules in pairs either in connectors DIMM_1 and DIMM_2 or connectors DIMM_3 and DIMM_4.

Addressing Memory With 4-GB Configurations

Your computer supports a maximum of 4 GB of memory when you use four 1-GB DIMMs. Current operating systems, such as Microsoft® Windows® XP, can only use a maximum of 4 GB of address space; however, the amount of memory available to the operating system is less than 4 GB. Certain components within the computer require address space in the 4-GB range. Any address space reserved for these components cannot be used by computer memory.

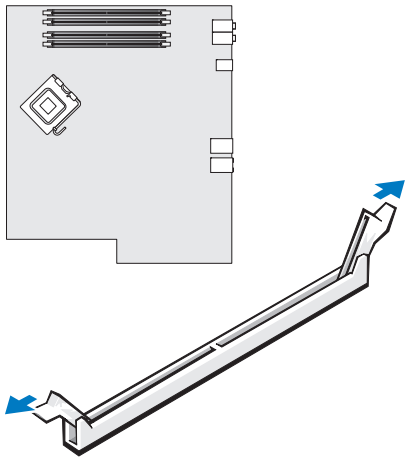
Installing Memory

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

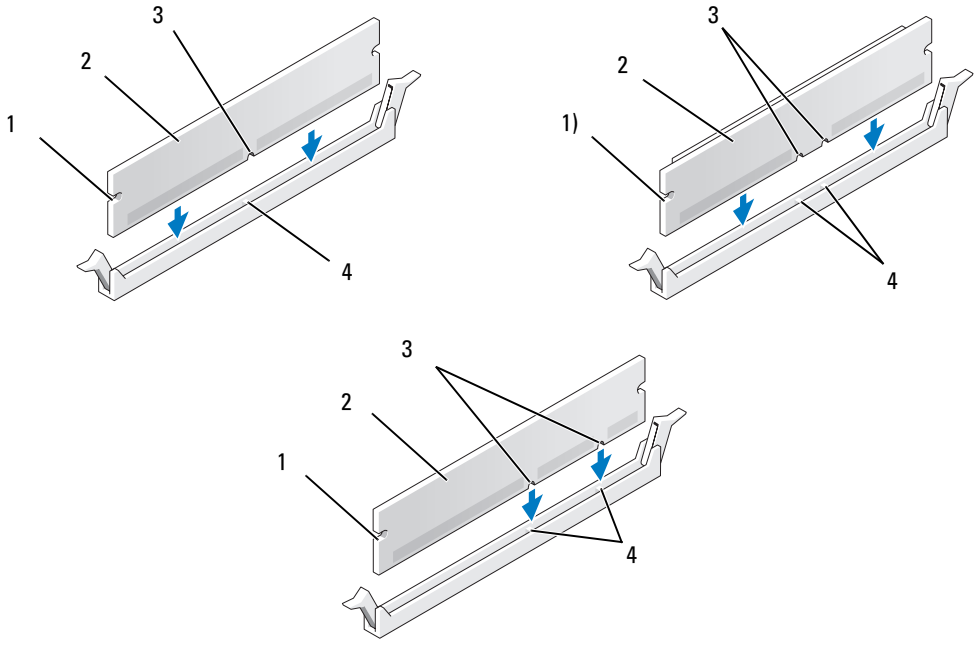
NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer.

1. Follow the procedures in "Before You Begin" on page 77.
2. Remove the computer cover (see "Removing the Computer Cover" on page 78).
3. Lay the computer on its side so that the system board is on the bottom of the inside of the computer.

4 Press out the securing clip at each end of the memory module connector.



5 Align the notch on the bottom of the module with the crossbar in the connector.



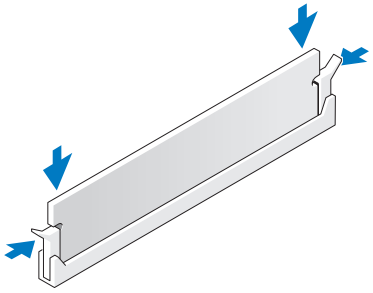
1 cutouts (2) 2 memory module 3 notch

4 crossbar

NOTICE: To avoid damage to the memory module, press the module straight down into the connector while you apply equal force to each end of the module.

6 Insert the module into the connector until the module snaps into position.

If you insert the module correctly, the securing clips snap into the cutouts at each end of the module.



7 Replace the computer cover.

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

8 Connect your computer and devices to electrical outlets, and then turn them on.

9 Right-click the **My Computer** icon, then click **Properties**.

10 Click the **General** tab.

11 To verify that the memory is installed correctly, check the amount of memory (RAM) listed.

Removing Memory

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer.

1 Follow the procedures in "Before You Begin" on page 77.

2 Remove the computer cover (see "Removing the Computer Cover" on page 78).

3 Press out the securing clip at each end of the memory module connector.

4 Grasp the module and pull up.

If the module is difficult to remove, gently ease the module back and forth to remove it from the connector.

Cards

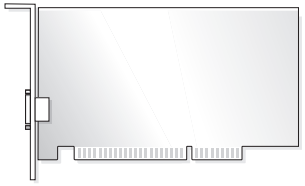
CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer.

Your Dell™ computer provides the following slots for PCI and PCI Express cards:

- Three PCI card slots
- One PCI Express x1 card slot
- One PCI Express x16 card slot
- One PCI Express x4 card slot

PCI Cards

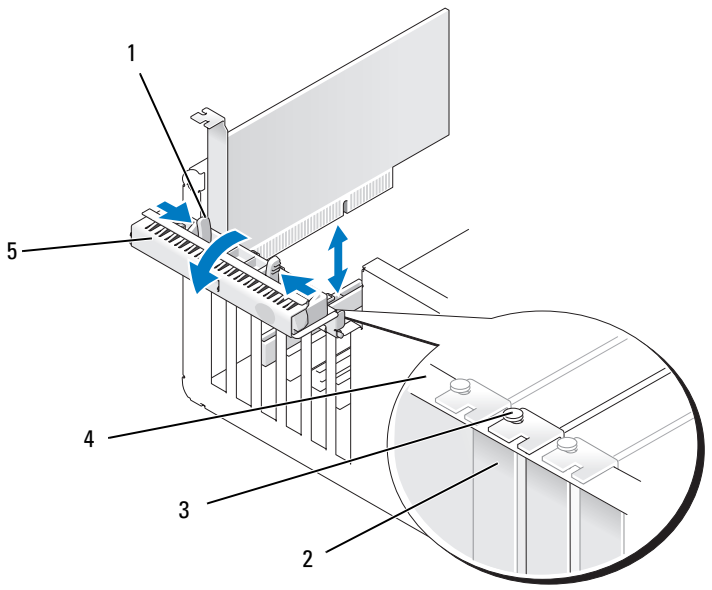


- If you are installing or replacing a card, follow the procedures in the next section.
- If you are removing but not replacing a card, see "Removing a PCI Card" on page 90.
- If you are replacing a card, remove the current driver for the card from the operating system.
- If you are installing or replacing a PCI Express card, see "Installing a PCI Express Card" on page 92.

Installing a PCI Card

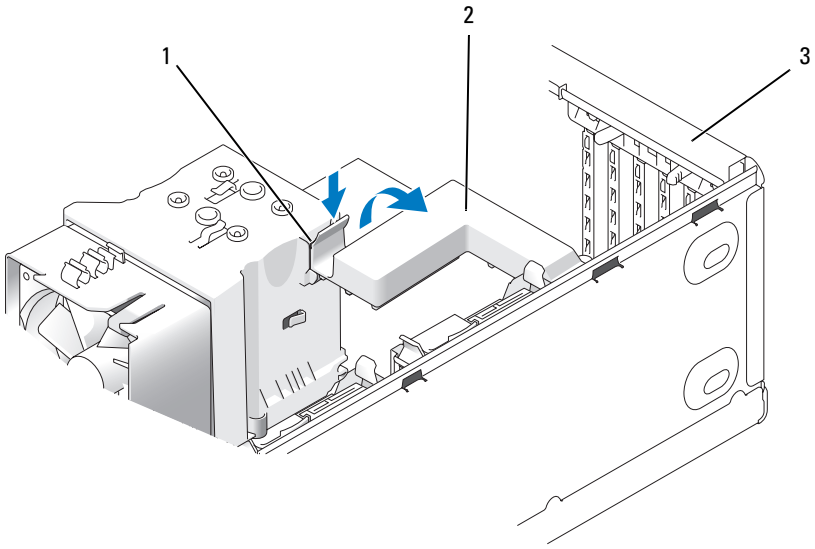
NOTE: Dell offers an optional customer kit for Audigy II and IEEE 1394 PCI add-in-cards that includes a front-mounted IEEE 1394 connector.

1. Follow the procedures in "Before You Begin" on page 77.
2. Remove the computer cover (see "Removing the Computer Cover" on page 78).



1	release tabs (2)	2	filler bracket	3	alignment guide
4	alignment bar	5	card retention door		

3 Push the two release tabs on the card retention door from the inside to pivot the door open. Because the door is hinged, it will remain in the open position.



1 release tab 2 card retention mechanism 3 card retention door

4 If your computer includes a card retention mechanism to secure the x16 card, press the release tab downward gently and then pivot the mechanism upward to access the card slots.

5 If you are installing a new card, remove the filler bracket to create a card-slot opening. Then continue with step 7.

6 If you are replacing a card that is already installed in the computer, remove the card.

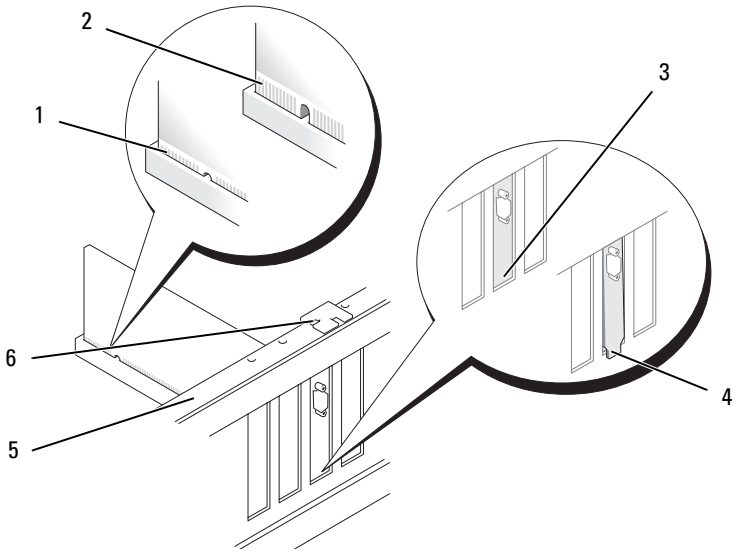
If necessary, disconnect any cables connected to the card. Grasp the card by its top corners, and ease it out of its connector.

7 Prepare the card for installation.

See the documentation that came with the card for information on configuring the card, making internal connections, or otherwise customizing it for your computer.

CAUTION: Some network adapters automatically start the computer when they are connected to a network. To guard against electrical shock, be sure to unplug your computer from its electrical outlet before installing any cards.

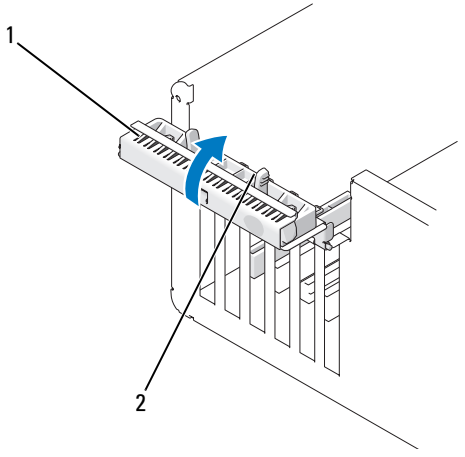
8 Place the card in the connector and press down firmly. Ensure that the card is fully seated in the slot.



1	fully seated card	2	not fully seated card	3	bracket within slot
4	bracket caught outside of slot	5	alignment bar	6	alignment guide

9 Before you close the card retention door, ensure that:

- The tops of all cards and filler brackets are flush with the alignment bar.
- The notch in the top of the card or filler bracket fits around the alignment guide.



1	card retention door	2	release tabs (2)

10 Close the card retention door by snapping it into place to secure the card(s).

NOTICE: Do not route card cables over or behind the cards. Cables routed over the cards can prevent the computer cover from closing properly or cause damage to the equipment.

11 Connect any cables that should be attached to the card.

See the documentation for the card for information about the card cable connections.

NOTICE: To connect a network cable, first plug the cable into the network device and then plug the cable into the computer.

12 If you replaced a card that was already installed in the computer and you removed the retention mechanism, reinstall the retention mechanism.

13 Before replacing the card retention mechanism, ensure that:

- The tops of all cards and filler brackets are flush with the alignment bar.
- The notch in the top of the card or filler bracket fits around the alignment guide.

14 Snap the card retention mechanism into place, securing the PCI card.

15 Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.

16 If you installed a sound card:

a Enter system setup, select **Integrated Audio Controller**, and then change the setting to **Off**.

b Connect external audio devices to the sound card connectors. Do not connect external audio devices to the integrated microphone, speaker/headphone, or line-in connectors on the back panel.

17 If you installed an add-in network adapter and want to disable the integrated network adapter:

a Enter system setup, select **Integrated NIC Controller,** and then change the setting to **Off**.

b Connect the network cable to the add-in network adapter connectors. Do not connect the network cable to the integrated connector on the back panel.

18 Install any drivers required for the card as described in the card documentation.

Removing a PCI Card

1 Follow the procedures in "Before You Begin" on page 77.

2 Remove the computer cover (see "Removing the Computer Cover" on page 78).

3 If you are removing the card permanently, install a filler bracket in the empty card-slot opening.

If you need a filler bracket, contact Dell (see "Contacting Dell" on page 137).

NOTE: Installing filler brackets over empty card-slot openings is necessary to maintain FCC certification of the computer. The brackets also keep dust and dirt out of your computer.

NOTICE: To connect a network cable, first plug the cable into the network device and then plug the cable into the computer.

4 Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.

5 Remove the card driver from the operating system.

6 If you removed a sound card:

   a Enter system setup, select **Integrated Audio Controller**, and then change the setting to **On**.

   b Connect external audio devices to the audio connectors on the back panel of the computer.

7 If you removed an add-in network connector:

   a Enter system setup, select **Integrated NIC Controller**, and then change the setting to **On**.

   b Connect the network cable to the integrated connector on the back panel of the computer.

PCI Express Cards

Your computer supports:

- One PCI Express x1 card
- One PCI Express x16 card
- One PCI Express x4 card

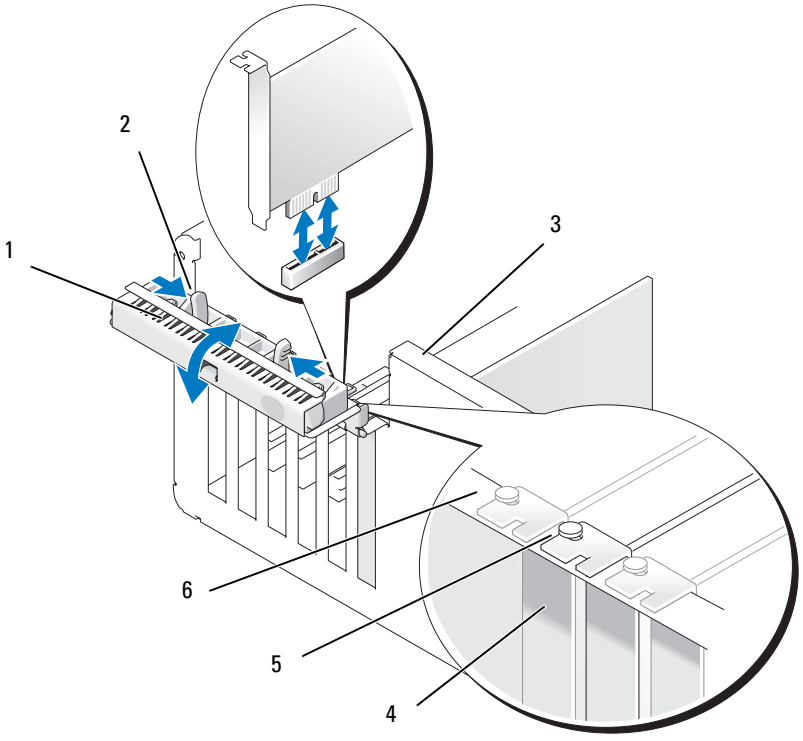
If you are installing or replacing a PCI Express card, follow the procedures in the next section. If you are removing but not replacing a card, see "Removing a PCI Express Card" on page 97.

If you are replacing a card, remove the current driver for the card from the operating system.

If you are installing or replacing a PCI card, see "Installing a PCI Card" on page 86.

Installing a PCI Express Card

1 Follow the procedures in "Before You Begin" on page 77.

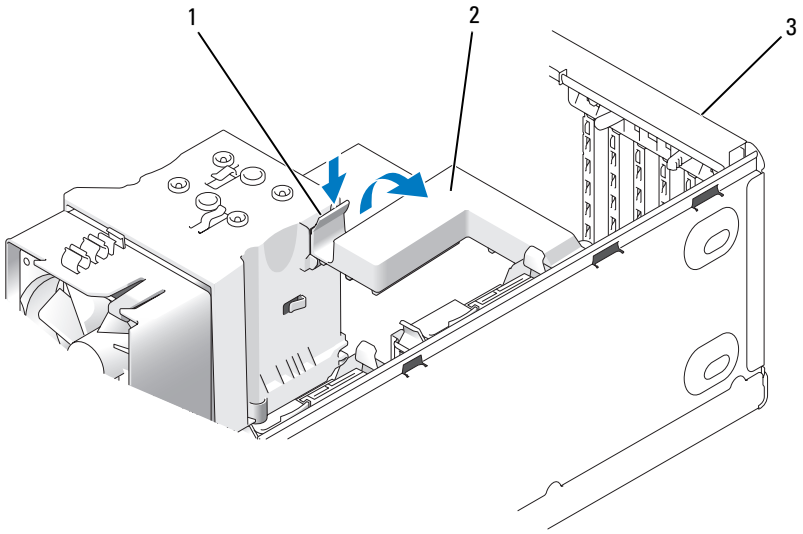


1	card retention door	2	release tabs (2)	3	lever on chassis wall (may not be present on all computers)
4	filler bracket	5	alignment guide	6	alignment bar

2 If present on your computer, rotate the lever on the chassis wall upward.

3 Push the two release tabs on the card retention door toward each other and pivot the door open. Because the door is captive, it will remain in the open position.

4 If your computer includes a card retention mechanism to secure the x16 card, press the release tab downward gently and then pivot the mechanism upward to access the card slots.



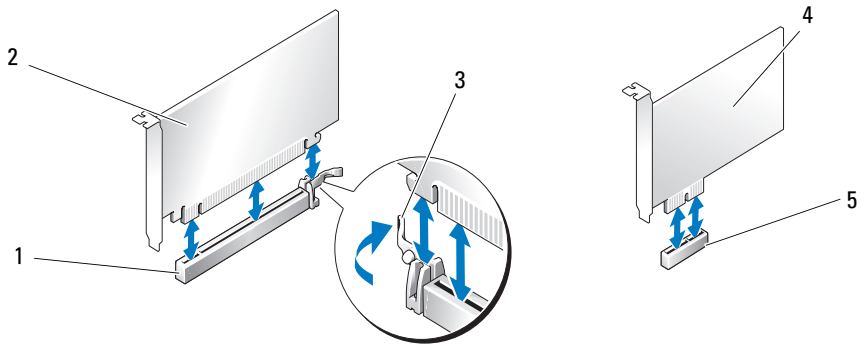
1	release tab	2	card retention mechanism	3	card retention door

5 If you are installing a new card, remove the filler bracket to create a card-slot opening. Then continue with step 7.

6 If you are replacing a card that is already installed in the computer, remove the existing card.

If necessary, disconnect any cables connected to the card. If your card includes a retention mechanism, remove the top of the retention mechanism by pressing the tab and pulling up on the top.

7 Pull the securing tab, grasp the card by its top corners, and then ease it out of its connector.



1	PCI Express x16 card slot	2	PCI Express x16 card	3	securing tab
4	PCI Express x1 card	5	PCI Express x1 card slot		

8 Prepare the card for installation.

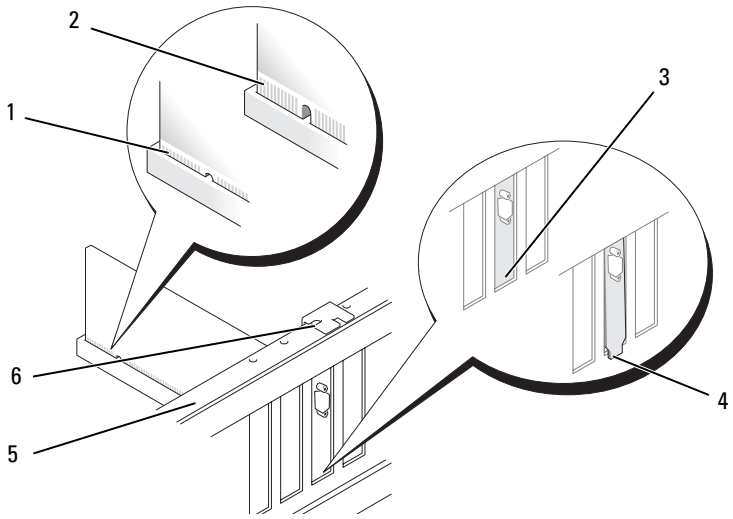
See the documentation that came with the card for information on configuring the card, making internal connections, or otherwise customizing it for your computer.

CAUTION: Some network adapters automatically start the computer when they are connected to a network. To guard against electrical shock, be sure to unplug your computer from its electrical outlet before installing any cards.

9 If you are installing the card into the x16 card connector, position the card so that the securing slot is aligned with the securing tab.

NOTICE: Ensure that you release the securing tab to seat the card. If the card is not installed correctly, you may damage the system board.

10 Place the card in the connector and press down firmly. Ensure that the card is fully seated in the slot.

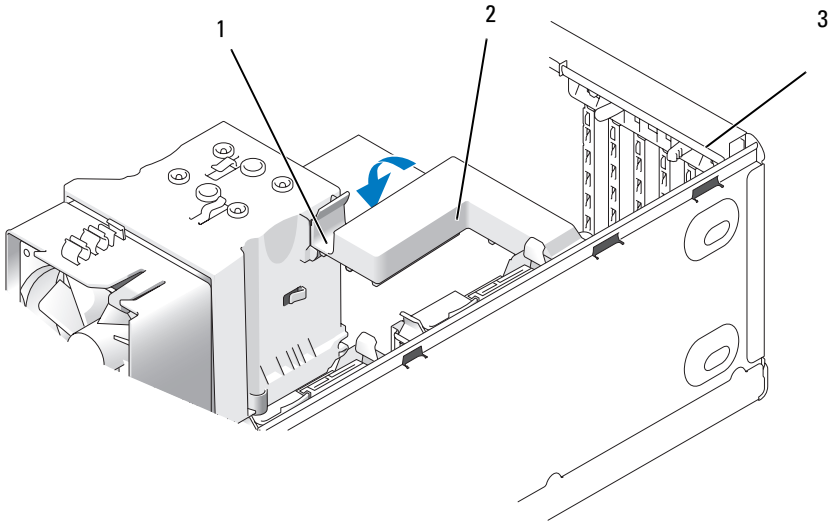


1	fully seated card	2	not fully seated card	3	bracket within slot
4	bracket caught outside of slot	5	alignment bar	6	alignment guide

11 Ensure that:

- The tops of all cards and filler brackets are flush with the alignment bar.
- The notch in the top of the card or filler bracket fits around the alignment guide.

12 If you removed a card retention mechanism, snap it into place, securing the PCI-E card.



1 release tab 2 card retention mechanism 3 card retention door

NOTICE: Do not route card cables over or behind the cards. Cables routed over the cards can prevent the computer cover from closing properly or cause damage to the equipment.

NOTICE: To connect a network cable, first plug the cable into the network device and then plug the cable into the computer.

13 Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.

14 If you installed a sound card:

- **a** Enter system setup, select **Integrated Audio Controller**, and then change the setting to **Off**.
- **b** Connect external audio devices to the sound card's connectors. Do not connect external audio devices to the integrated microphone, speaker/headphone, or line-in connectors on the back panel.

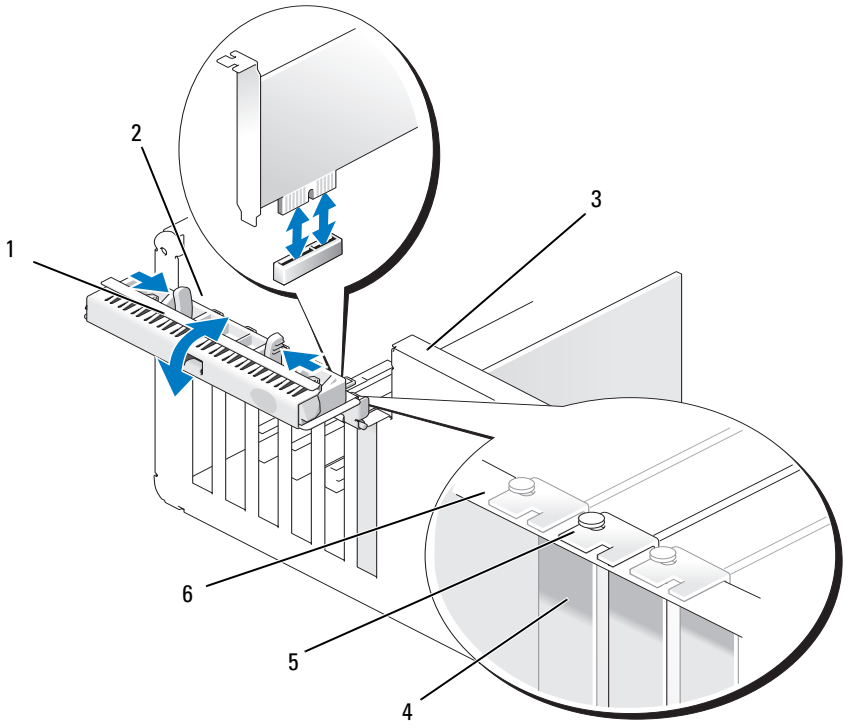
15 If you installed an add-in network adapter and want to disable the integrated network adapter:

- **a** Enter system setup, select **Integrated NIC Controller,** and then change the setting to **Off**.
- **b** Connect the network cable to the add-in network adapter's connectors. Do not connect the network cable to the integrated connector on the back panel.

16 Install any drivers required for the card as described in the card documentation.

Removing a PCI Express Card

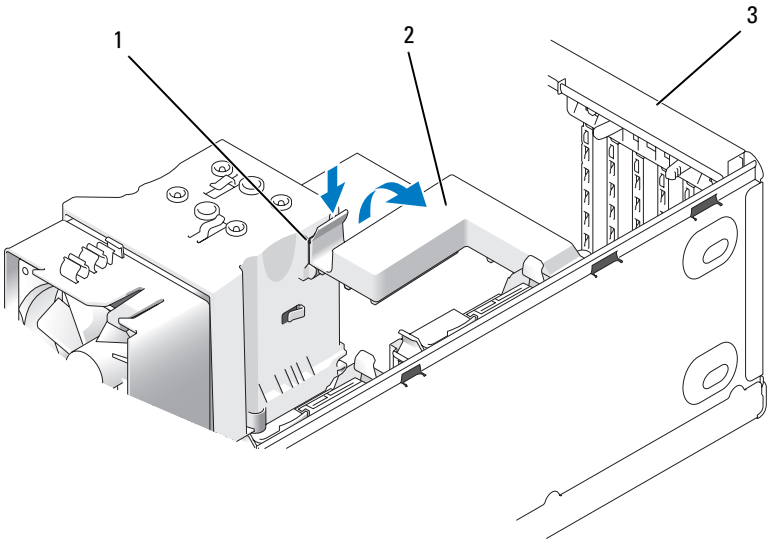
1. Follow the procedures in "Before You Begin" on page 77.
2. Remove the computer cover (see "Removing the Computer Cover" on page 78).



1	card retention door	2	release tabs (2)	3	lever on chassis wall (may not be present on all computers)
4	filler bracket	5	alignment guide	6	alignment bar

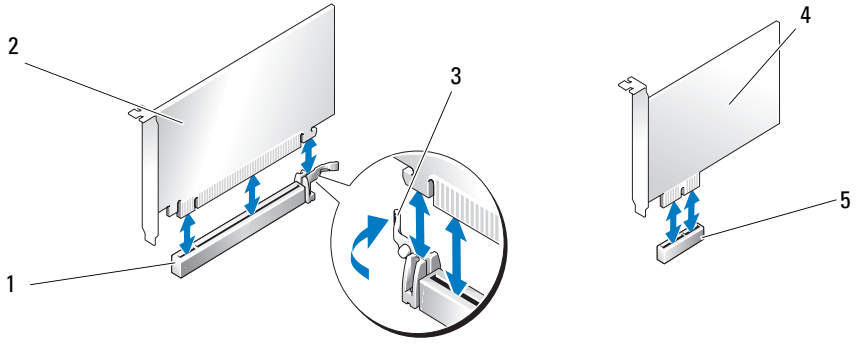
3. If present on your computer, rotate the lever on the chassis wall upward.

4 Push the two release tabs on the card retention door toward each other and pivot the door open. Because the door is hinged, it will remain in the open position.



1 release tab 2 card retention mechanism 3 card retention door

5 If your computer includes a card retention mechanism to secure the x16 card, press the release tab downward gently and then pivot the mechanism upward to access the card slots.



1 PCI Express x16 card slot 2 PCI Express x16 card 3 securing tab
4 PCI Express x1 card 5 PCI Express x1 card slot

NOTICE: Ensure that you release the securing tab to unseat the card. If the card is not removed correctly, the system board may be damaged.

6 Release the securing tab on the card slot to unseat the card.

7 If you are removing the card permanently, install a filler bracket in the empty card-slot opening.

If you need a filler bracket, contact Dell (see "Contacting Dell" on page 137).

NOTE: Installing filler brackets over empty card-slot openings is necessary to maintain FCC certification of the computer. The brackets also keep dust and dirt out of your computer.

8 Reseat the card retention mechanism in the tabs and pivot downward to snap it into place.

9 Close the card retention door to snap it into place, securing the card(s).

NOTE: For full-length PCI-E cards, if a "piano" bracket is present on your computer you need to rotate it down into place.

NOTICE: To connect a network cable, first plug the cable into the network device and then plug the cable into the computer.

10 Replace the computer cover, reconnect the computer and devices to electrical outlets, and then turn them on.

11 Remove the card driver from the operating system.

12 If you removed a sound card:

a Enter system setup, select **Integrated Audio Controller**, and then change the setting to **On**.

b Connect external audio devices to the integrated audio connectors on the back panel of the computer.

13 If you removed an add-in network connector:

a Enter system setup, select **Integrated NIC Controller**, and then change the setting to **On**.

b Connect the network cable to the integrated connector on the back panel of the computer.

NOTE: Install any drivers required for the card as described in the card documentation.

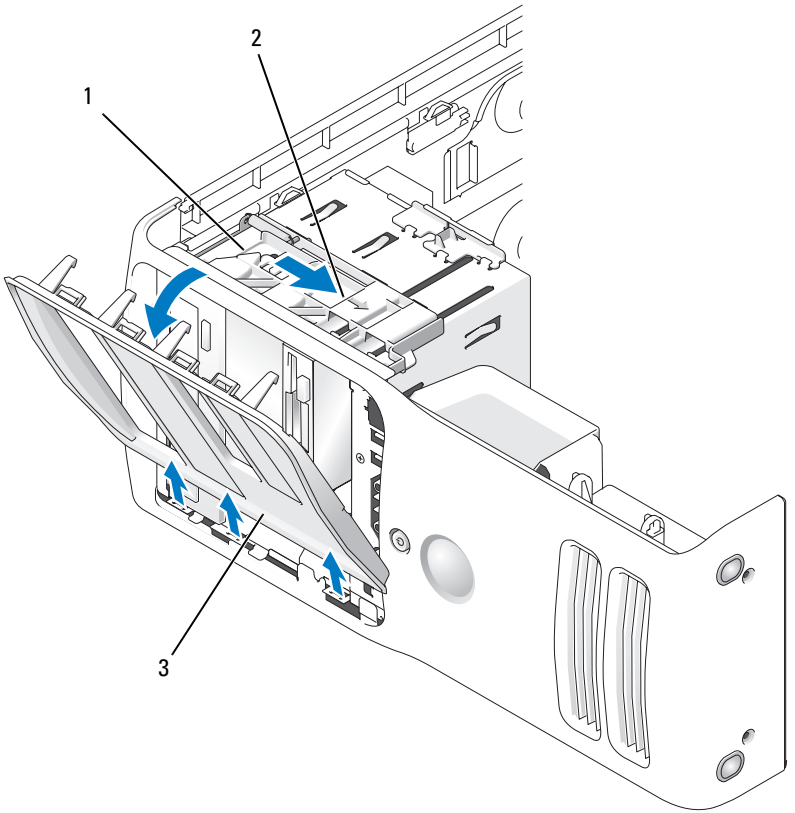
Drive Panels

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before removing the cover.

Removing the Drive Panel

1. Follow the procedures in "Before You Begin" on page 77.
2. Remove the computer cover (see "Removing the Computer Cover" on page 78).



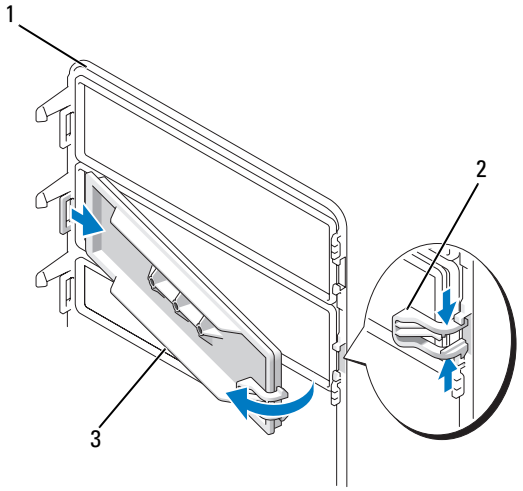
1	sliding plate	2	sliding plate lever	3	drive panel

3 Grasping the lever on the sliding plate, pull the sliding plate to the right and hold in place.

NOTE: The sliding plate secures and releases the drive panel and helps to secure the drives. Push from the inside and pivot the drive panel to the left to release the panel from its side hinges.

4 Set the drive panel aside in a secure location.

Removing the Drive-Panel Insert



1 drive panel 2 drive-panel insert tab 3 drive-panel insert

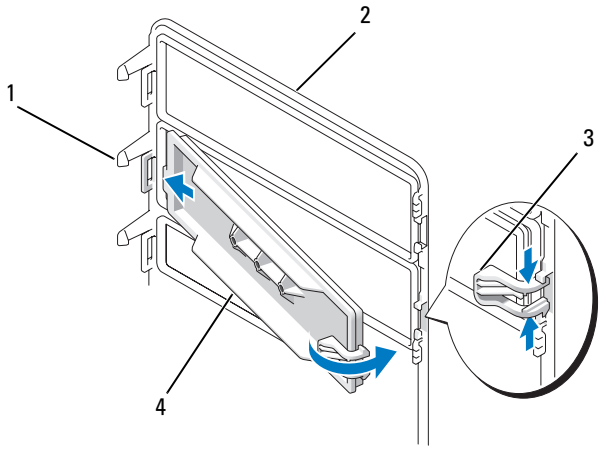
1 Turn the drive panel sideways and find the tip of the drive-panel insert tab that latches over a tab on the right side of the drive panel.

2 Pull the inner tip of the drive-panel insert tab away from the drive panel.

3 Pivot the drive-panel insert out and away from the drive panel.

4 Set the drive-panel insert aside in a secure location.

Replacing the Drive-Panel Insert

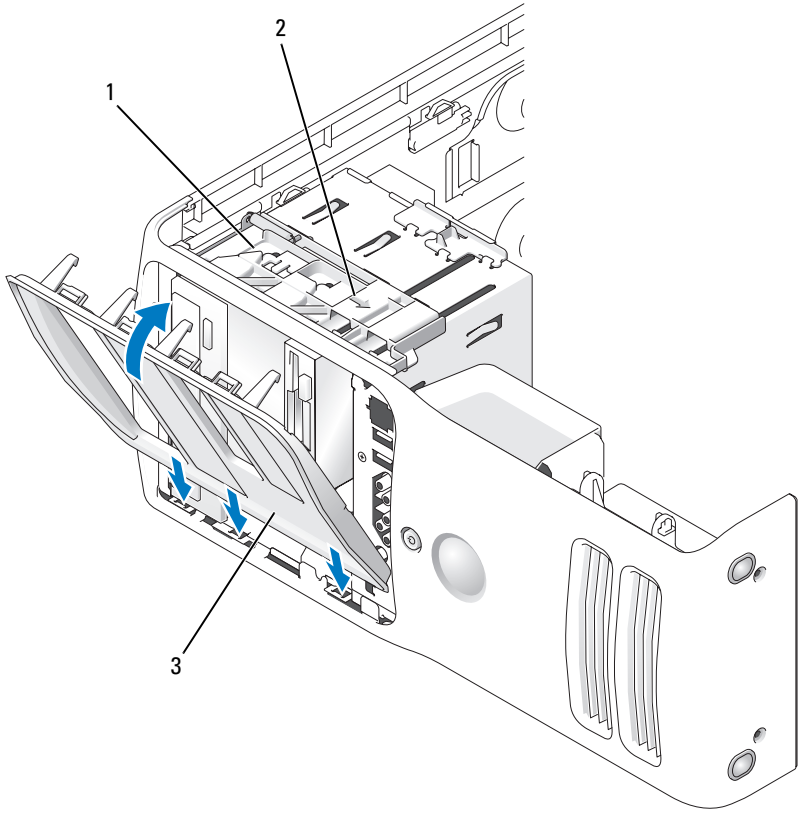


1	center drive-panel tab	2	drive panel	3	drive-panel insert tab
4	drive-panel insert				

1. Slide the tab on the left side of the drive-panel insert under the center drive panel tab.
2. Rotate the drive-panel insert into place and snap the drive-panel insert tab over the corresponding tab on the drive panel.
3. Ensure that the drive-panel insert is correctly seated in the drive panel.

Replacing the Drive Panel

1 Follow the procedures in "Before You Begin" on page 77.



1	sliding plate	2	sliding plate lever	3	drive panel

2 Align the drive panel tabs with the side-door hinges.

3 Rotate the drive panel toward the computer until the sliding plate lever clicks into place and the drive panel snaps into place on the front panel.

Drives

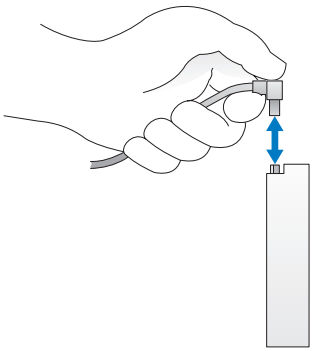
Your computer supports:

- Two hard drives (Serial ATA)
- Two FlexBay drives (can contain an optional floppy drive and an optional Media Card Reader)
- Two CD or DVD drives

General Installation Guidelines

Connect the hard drives to the connectors labeled "SATA0" and "SATA1", starting with SATA0. Connect CD/DVD drives to the connectors labeled "SATA4" or "SATA5", starting with SATA4.

Serial ATA hard drives and CD/DVD drives are connected to the connectors labeled "SATA0" to "SATA5" on the system board.



When connecting and disconnecting a serial ATA cable, hold the cable by the connector at each end.

Hard Drive

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

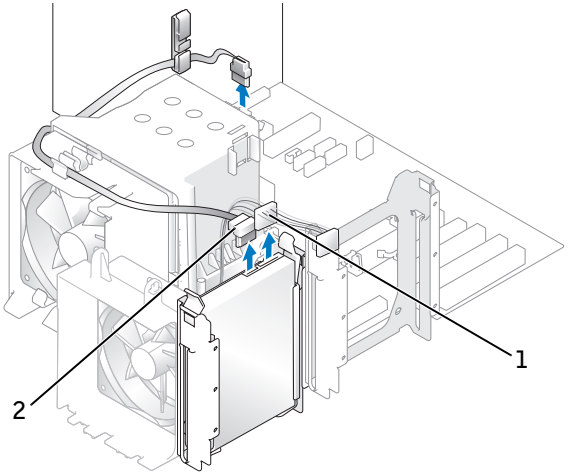
CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

NOTICE: To avoid damage to the drive, do not set it on a hard surface. Instead, set the drive on a surface, such as a foam pad, that will sufficiently cushion it.

If you are replacing a hard drive that contains data, back up your files before you begin this procedure

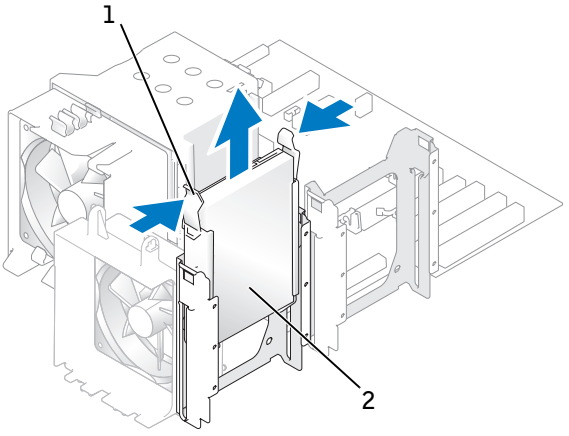
Removing a Hard Drive

1. Follow the procedures in "Before You Begin" on page 77.
2. Remove the computer cover (see "Removing the Computer Cover" on page 78).
3. Disconnect the power and hard drive cables from the drive.



1 power cable 2 hard drive cable

4. Press in on the tabs on each side of the drive and slide the drive up and out.



1 tabs (2) 2 hard drive

5 Replace the computer cover (see "Replacing the Computer Cover" on page 121).

6 If removing this drive changes the drive configuration, then be sure to reflect these changes in the BIOS. When you restart your computer, enter system setup (see "System Setup" on page 127). Then, go to the "Drives" section of the BIOS and under `SATA 0 through 5`, set the SATA ports to the correct configuration.

Installing a Hard Drive

1 Follow the procedures in "Before You Begin" on page 77.

2 Remove the computer cover (see "Removing the Computer Cover" on page 78).

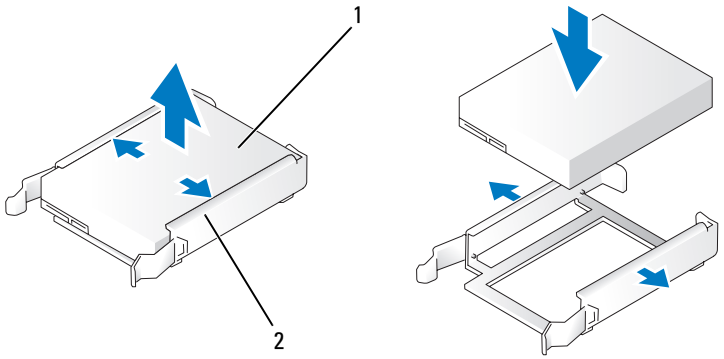
3 Unpack the replacement hard drive, and prepare it for installation.

4 Check the documentation for the drive to verify that the drive is configured for your computer.

5 If your replacement hard drive does not have the hard drive bracket attached, remove the bracket from the old hard drive by unsnapping it from the drive.

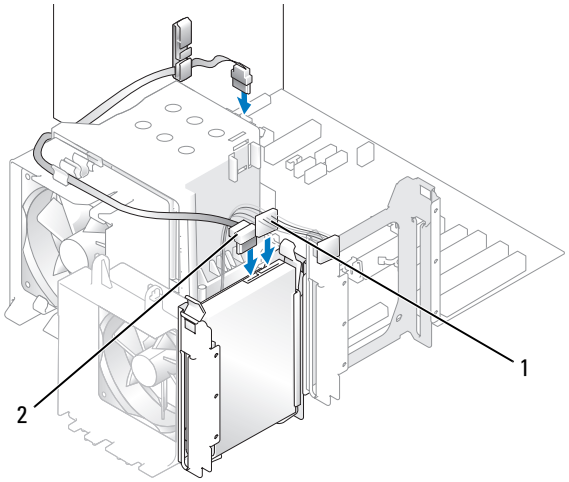
6 Snap the hard drive bracket onto the replacement hard drive.

7 Install the hard drive into the computer by sliding the drive into place until you feel it click into place.



1 hard drive 2 hard drive bracket

8 Connect the power and hard drive cables to the hard drive.



1 power cable 2 hard drive cable

9 Check all connectors to be certain that they are properly cabled and firmly seated.

10 Replace the computer cover (see "Replacing the Computer Cover" on page 121).

NOTICE: To connect a network cable, first plug the cable in to the network wall jack and then plug the cable into the computer.

11 Connect your computer and devices to electrical outlets, and then turn them on.

12 If installing this drive changes the drive configuration, then be sure to reflect these changes in the BIOS. When you restart your computer, enter system setup (see "System Setup" on page 127). Then, go to the "Drives" section of the BIOS and under `SATA 0 through 5`, set the SATA ports to the correct configuration.

See the documentation that came with the hard drive for instructions about installing any software required for the operation of the hard drive.

Adding a Second Hard Drive

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

NOTICE: To avoid damage to the drive, do not set it on a hard surface. Instead, set the drive on a surface, such as a foam pad, that will sufficiently cushion it.

1 Check the documentation for the drive to verify that it is configured for your computer.

2 Follow the procedures in "Before You Begin" on page 77.

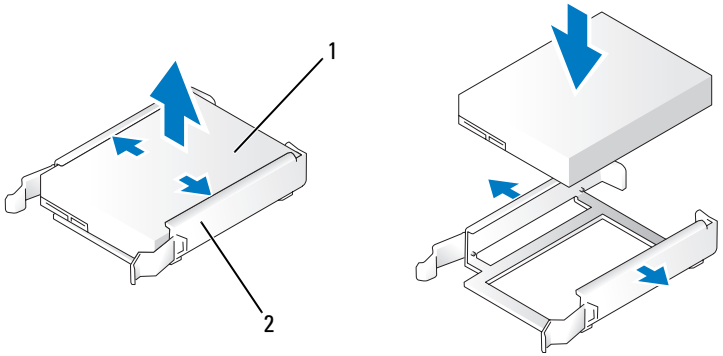
3 Remove the computer cover (see "Removing the Computer Cover" on page 78).

4 Press in on the tabs on each side of the hard drive bracket in the empty drive bay and slide the bracket up and out.

5 Snap the hard drive bracket onto the new hard drive.

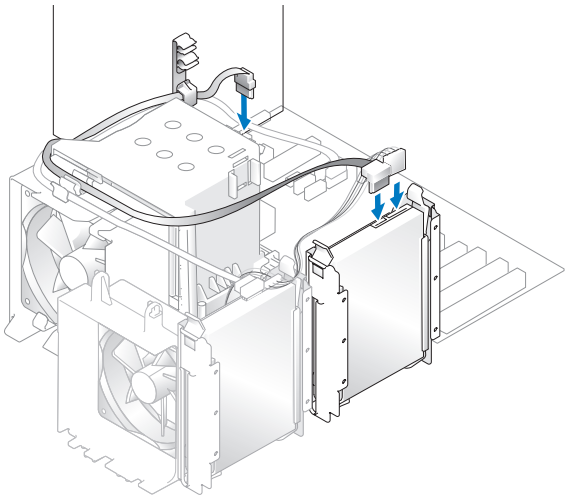
NOTICE: Do not install any drive into the lower hard-drive bay until you have removed the hard drive bracket from the inside of the hard drive bay.

6 Slide the new hard drive into empty bay until you feel a click.



1 hard drive 2 hard drive bracket

7 Connect the power and hard drive cables to the drive.



8 Check all connectors to be certain that they are properly cabled and firmly seated.

9 Replace the computer cover ("Replacing the Computer Cover" on page 121).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

10 Connect your computer and devices to electrical outlets, and then turn them on.

11 When you restart your computer, enter system setup (see "System Setup" on page 127). Then, go to the "Drives" section of the BIOS and under `SATA 0 through 5`, set the SATA port to "ON" for the hard drive you just installed. This enables the drive.

See the documentation that came with the drive for instructions on installing any software required for drive operation.

Floppy Drive

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

NOTE: If you are adding a floppy drive, see "Installing a Floppy Drive" on page 111.

Removing a Floppy Drive

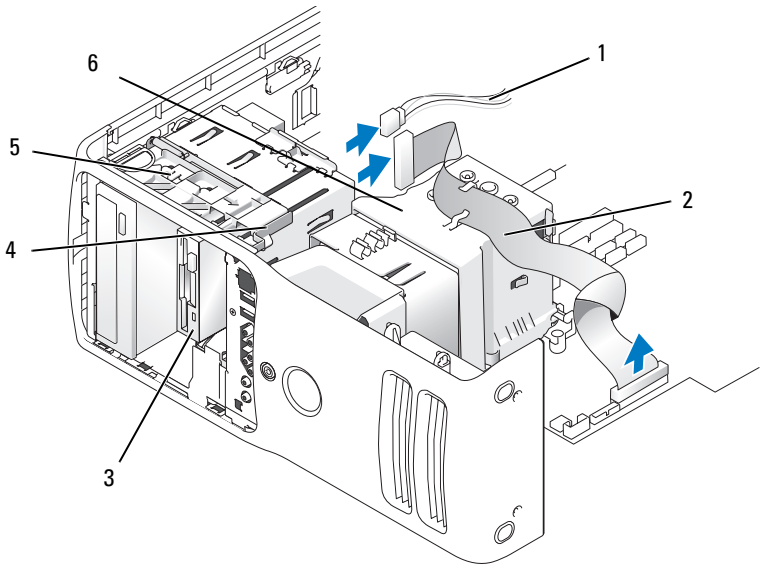
1 Follow the procedures in "Before You Begin" on page 77.

2 Remove the computer cover (see "Removing the Computer Cover" on page 78).

3 Remove the drive pane "Removing the Drive Panel" on page 100).

4 Disconnect the power and floppy drive cables from the back of the floppy drive.

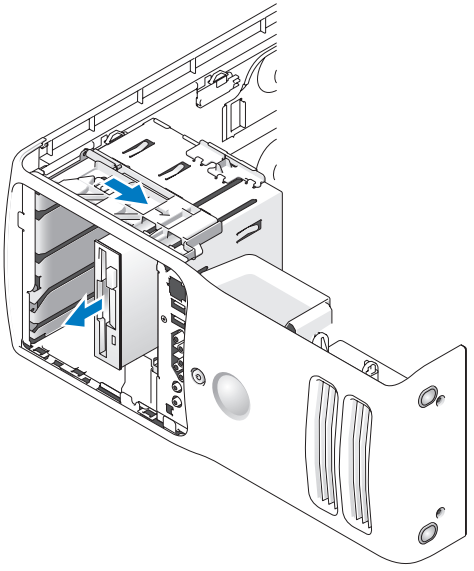
5 Unhook floppy drive cable from the clips on the processor shroud. Disconnect the other end of the floppy drive cable from the system board. Remove the floppy drive cable from the computer.



1	power cable	2	floppy drive cable	3	floppy drive
4	sliding plate lever	5	sliding plate	6	processor shroud

6 Pull the sliding plate to the right and hold in place.

7 Slide the floppy drive out of the floppy drive bay.



8 If you are not replacing the drive, reinstall the drive panel insert (see "Replacing the Drive-Panel Insert" on page 102)

9 If you are not replacing the drive, then be sure to reflect these changes in the BIOS. When you restart your computer, enter system setup (see "System Setup" on page 127). Then, go to the "Drives" section of the BIOS and under `Diskette Drive` set the value to "**none**".

Installing a Floppy Drive

1 Follow the procedures in "Before You Begin" on page 77.

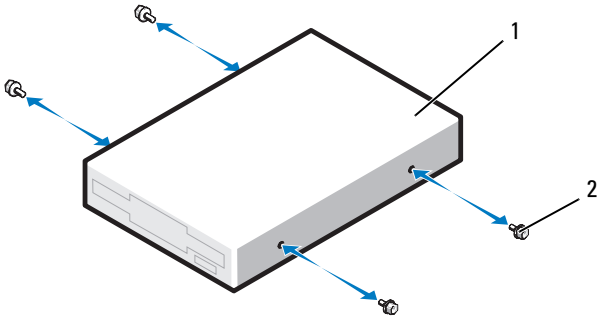
2 Remove the computer cover (see "Removing the Computer Cover" on page 78).

3 Lay the computer on its side so that the system board is on the bottom of the inside of the computer.

4 Remove the drive panel (see "Removing the Drive Panel" on page 100).

5 If installing a new floppy drive, remove the drive panel insert (see "Removing the Drive-Panel Insert" on page 101).

6 If you are installing a new floppy drive, remove the shoulder screws from the inside of the drive-panel insert and attach the screws to the new drive. See "Removing the Drive-Panel Insert" on page 101.



1 floppy drive 2 shoulder screws (4)

7 Slide the floppy drive into the floppy drive bay until the sliding plate clicks into place and the drive snaps into position.

8 Attach the power and floppy-drive cables to the floppy drive.

9 Check all cable connections, and fold cables out of the way to provide airflow for the fan and cooling vents.

10 Replace the computer cover (see "Replacing the Computer Cover" on page 121).

NOTICE: To connect a network cable, first plug the cable in to the network wall jack and then plug it in to the computer.

11 Connect your computer and devices to their electrical outlets, and then turn them on.

12 When you restart your computer, enter system setup (see "System Setup" on page 127). Then, go the the "`Diskette Drive`" section of the BIOS and under `Diskette Drive` set the value to "**Internal only**".

See the documentation that came with the floppy drive for instructions on installing any software required for the operation of the drive.

13 Enter system setup (see "System Setup" on page 127) and select the appropriate **Diskette Drive** option.

14 Verify that your computer works correctly by running the Dell Diagnostics (see "Dell Diagnostics" on page 52).

Media Card Reader

For information on using the Media Card Reader, see "Using a Media Card Reader (Optional)" on page 31.

Removing a Media Card Reader

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

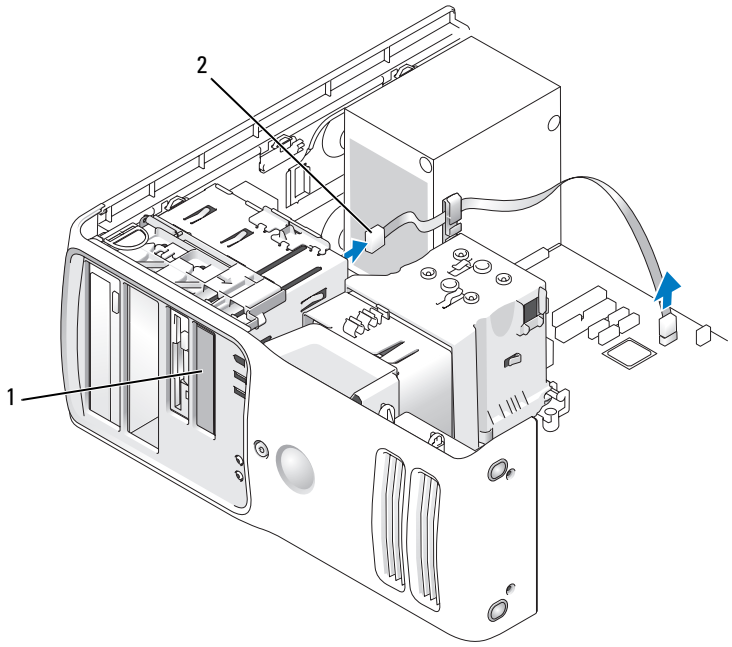
NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

1 Follow the procedures in "Before You Begin" on page 77.

2 Lay the computer on its side so that the system board is on the bottom of the inside of the computer.

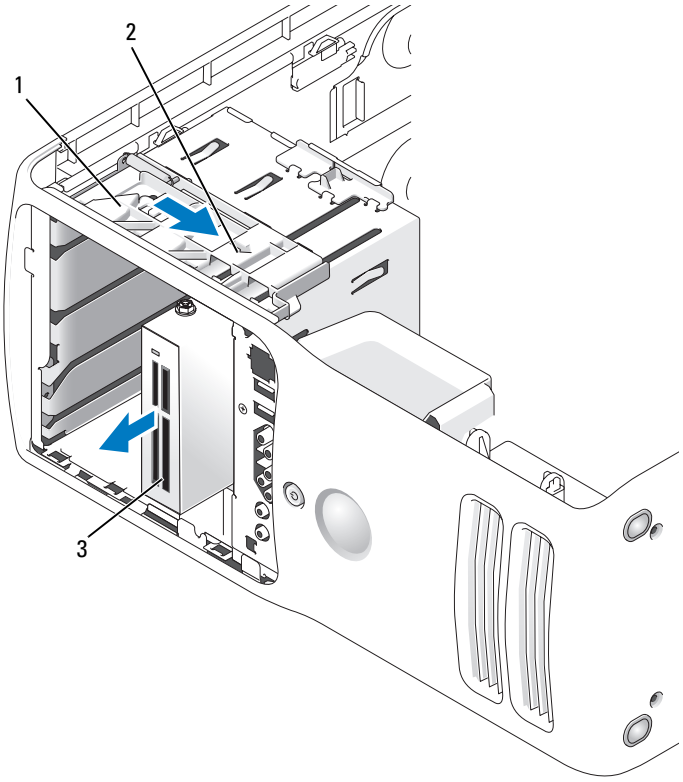
3 Remove the computer cover (see "Removing the Computer Cover" on page 78).

4 Remove the drive panel (see "Removing the Drive Panel" on page 100).



1	Media Card Reader (not present on all computers)	2	USB cable

5 Disconnect the USB cable on the back of the Media Card Reader. Disconnect the other end of the cable from the USB connector on the system board (see "System Board Components" on page 81). Remove the cable from any clips and lift out of the computer.



1	sliding plate	2	sliding plate lever	3	Media Card Reader (not present on all computers)

6 Pull the sliding plate to the right and hold in place. Then, slide the drive out the front of the computer.

7 Replace the drive panel insert (see "Replacing the Drive-Panel Insert" on page 102).

8 Replace the drive panel (see "Replacing the Drive Panel" on page 103).

9 Replace the computer cover (see "Replacing the Computer Cover" on page 121).

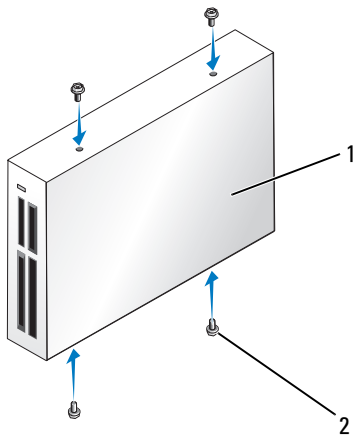
10 Power up the system and enter system setup (see "System Setup" on page 127). Set the `USB for FlexBay` value to **OFF**.

Installing a Media Card Reader

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer chassis.

1. Follow the procedures in "Before You Begin" on page 77.
2. Lay the computer on its side so that the system board is on the bottom of the inside of the computer.
3. Remove the computer cover (see "Removing the Computer Cover" on page 78).
4. Remove the drive panel (see "Removing the Drive Panel" on page 100).
5. Remove the drive panel insert (see "Removing the Drive-Panel Insert" on page 101).
6. Remove the Media Card Reader from its packaging.
7. Remove the shoulder screws from the inside of the drive-panel insert and attach the screws to the new drive.

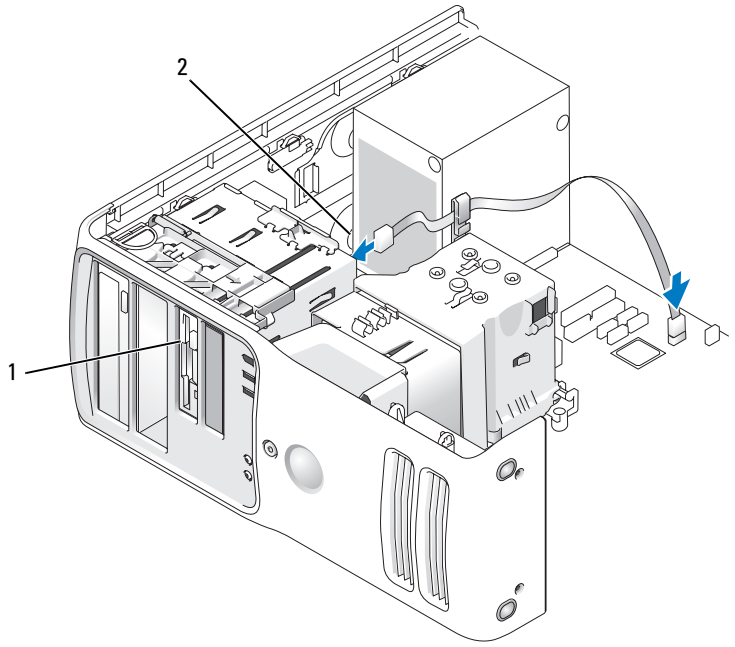


1 Media Card Reader 2 screws (4)

8. Gently slide the drive into place until you feel a click or feel the drive securely installed.

NOTE: Ensure that the Media Card Reader is installed before connecting the USB cable.

9 Connect the USB cable to the back of the Media Card Reader and to the USB connector on the system board (see "System Board Components" on page 81).



1 Media Card Reader (optional) 2 USB cable

10 Route the USB cable through the cable routing clip.

11 Replace the computer cover (see "Replacing the Computer Cover" on page 121).

12 Power up the system and enter system setup (see "System Setup" on page 127). Set the `USB for FlexBay` value to **ON**.

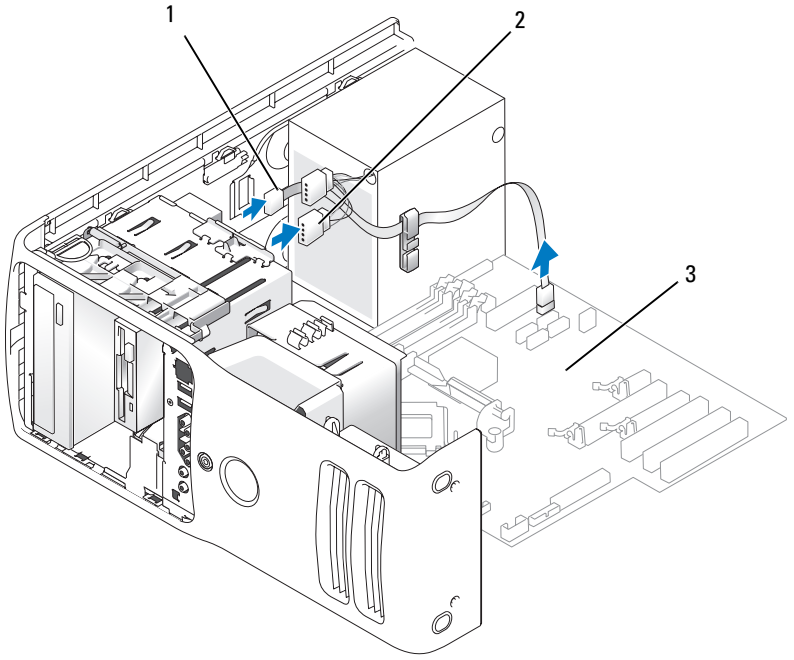
CD/DVD Drive

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

CAUTION: To guard against electrical shock, always unplug your computer from the electrical outlet before opening the cover.

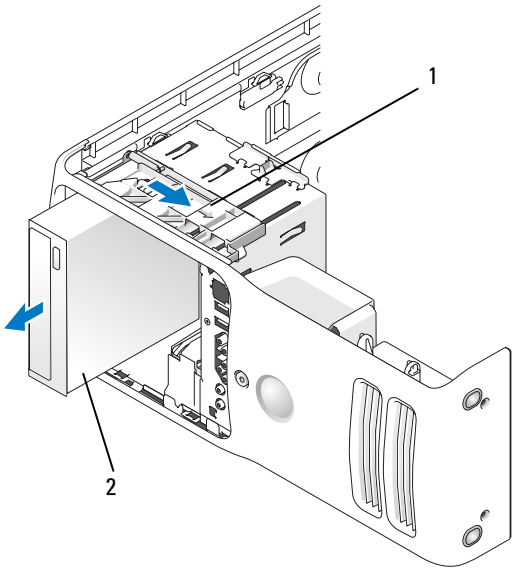
Removing a CD/DVD Drive

1. Follow the procedures in "Before You Begin" on page 77.
2. Remove the computer cover (see "Removing the Computer Cover" on page 78).
3. Remove the drive panel (see "Removing the Drive Panel" on page 100).
4. Disconnect the power cable from the back of the drive and the CD/DVD drive cable from the back of the drive and the system board.



1	CD/DVD drive cable	2	power cable	3	system board

5 Slide the drive release mechanism to the right to release the shoulder screw and slide the drive out to remove it from the drive bay.



1 sliding plate 2 CD drive

6 If you are not replacing the drive, replace the drive panel insert (see "Replacing the Drive-Panel Insert" on page 102.

7 Replace the drive panel (see "Replacing the Drive Panel" on page 103).

8 Replace the computer cover (see "Replacing the Computer Cover" on page 121).

9 If you are removing and not replacing this drive, then be sure to disable the drive in the BIOS. When you restart your computer, enter system setup (see "System Setup" on page 127). Then, go to the "Drives" section of the BIOS and under `SATA 0 through 5`, set the SATA ports to the correct configuration.

Installing a CD/DVD Drive

1 Follow the procedures in "Before You Begin" on page 77

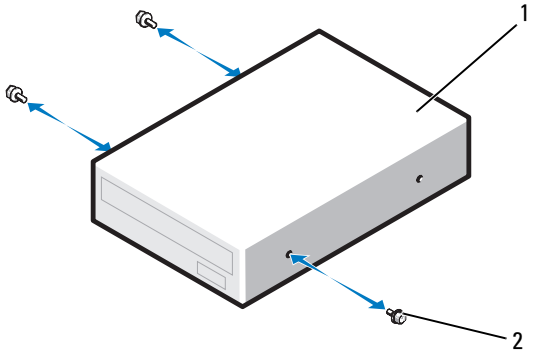
2 Remove the computer cover (see "Removing the Computer Cover" on page 78).

3 If you are installing a new drive, unpack the drive and prepare it for installation.

Check the documentation that accompanied the drive to verify that the drive is configured for your computer.

4 If you are installing a new drive, remove the drive panel insert (see "Removing the Drive-Panel Insert" on page 101).

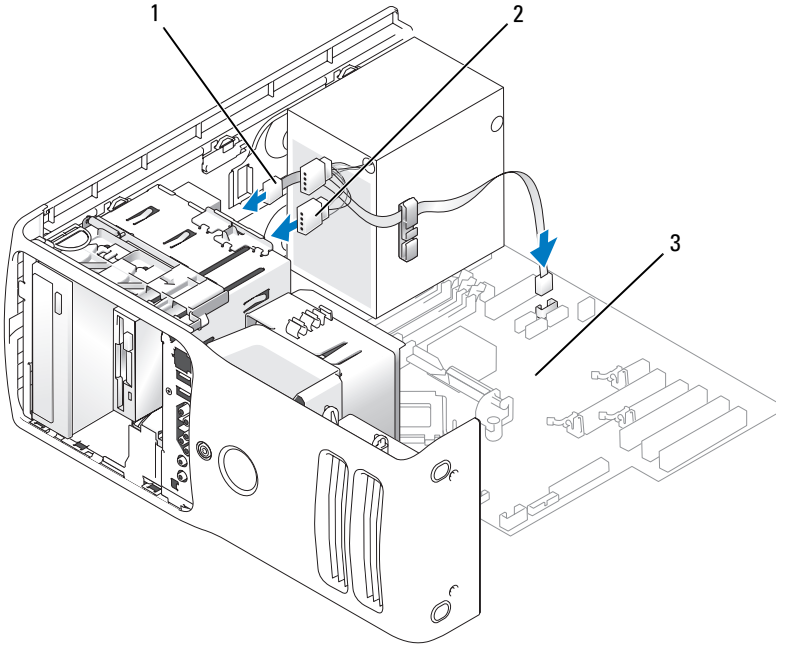
5 Remove three shoulder screws from the inside of the drive-panel insert and attach the screws to the new drive.



1 CD/DVD drive 2 shoulder screws (3)

6 Slide the drive into the drive bay until the drive clicks into position.

7 Connect the power cable to the drive and the CD/DVD cable to the drive and system board.



1 CD/DVD cable 2 power cable 3 system board

8 Check all cable connections, and fold cables out of the way to provide airflow for the fan and cooling vents.

9 Replace the drive panel(see "Replacing the Drive Panel" on page 103).

10 Replace the computer cover (See "Replacing the Computer Cover" on page 121).

NOTICE: To connect a network cable, first plug the cable in to the network wall jack and then plug it in to the computer.

11 Connect your computer and devices to their electrical outlets, and then turn them on.

12 When you restart your computer, enter system setup (see "System Setup" on page 127). Then, go to the "Drives" section of the BIOS and under `SATA 0 through 5`, enable the SATA port for this drive.

See the documentation that came with the drive for instructions on installing any software required for drive operation.

13 Verify that your computer works correctly by running the Dell Diagnostics (see "Dell Diagnostics" on page 52).

Battery

Replacing the Battery

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

NOTICE: To prevent static damage to components inside your computer, discharge static electricity from your body before you touch any of your computer's electronic components. You can do so by touching an unpainted metal surface on the computer.

A coin-cell battery maintains computer configuration, date, and time information. The battery can last several years. If you have to repeatedly reset time and date information after turning on the computer, replace the battery.

CAUTION: A new battery can explode if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

To replace the battery:

1 Enter the system setup program and record the values for all the screens (see "Entering System Setup" on page 127) so that you can restore the correct settings after installing the new battery.

2 Follow the procedures in "Before You Begin" on page 77.

3 Remove the computer cover (see "Removing the Computer Cover" on page 78).

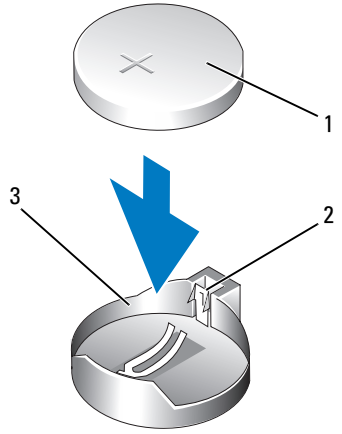
4 Locate the battery socket (see "System Board Components" on page 81).

NOTICE: If you pry the battery out of its socket with a blunt object, be careful not to touch the system board with the object. Ensure that the object is inserted between the battery and the socket before you attempt to pry out the battery. Otherwise, you may damage the system board by prying off the socket or by breaking circuit traces on the system board.

5 Remove the battery by carefully prying it out of its socket with your fingers or with a blunt, nonconducting object, such as a plastic screwdriver.

6 Insert the new battery into the socket with the side labeled "+" facing up, and then snap the battery into place.

7 Replace the computer cover.



1 battery 2 tab 3 battery socket

NOTICE: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

8 Connect your computer and devices to electrical outlets, and then turn them on.

9 Enter system setup and restore the settings you recorded in step 1 (see "Entering System Setup" on page 127).

10 Properly dispose of the old battery.

Replacing the Computer Cover

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

1 Ensure that all cables are connected, and fold cables out of the way.

Gently pull the power cables toward you so that they do not get caught underneath the drives.

2 Ensure that no tools or extra parts are left inside the computer.

3 Lower the cover into place:
   a Pivot the cover down.
   b Press down on the right side of the cover until it closes.
   c Press down on the left side of the cover until it closes.
4 Ensure that both sides of the cover are locked. If not, repeat all of step 3.

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

5 Connect your computer and devices to electrical outlets, and then turn them on.

A

Appendix

Specifications

Processor	
Processor type	Intel® Pentium® 4 Intel® Pentium® D Intel® Core™ 2 Duo
Level 2 (L2) Cache	at least 2 MB on Intel Pentium D, Pentium 4, and Core processors
Memory	
Type	dual-channel 533-, 667-, and 800-MHz DDR2
Memory connectors	four
Memory capacities	512 MB or 1 GB
Minimum memory	512 MB
Maximum memory	4 GB
BIOS address	F0000h
Computer Information	
Chipset	Intel P965 Express Chipset
DMA channels	eight
Interrupt levels	24
BIOS chip (NVRAM)	4 MB
NIC	Integrated Intel 82566DC Gigabit Network Connection
System clock	800- or 1066-MHz data rate (depending on your processor)
Video	
Type	PCI Express

Audio	
Type	Sigmatel 9227 audio codec Internal 7.1 channel or PCI option cards

Expansion Bus	
Bus type	PCI 32-bit (PCI Specification 2.2) PCI Express x1, x4, and x16 (PCI express 1.1a)
Bus speed	PCI: 33 MHz PCI Express:100 MHz
Bus throughput	PCI Express: x1 slot bidirectional speed - 500 MB/s x4 slot bidirectional speed - 2 GB/s x16 slot bidirectional speed - 8 GB/s
PCI	
connectors	three
connector size	120 pins
connector data width (maximum)	32 bits
PCI Express	
connector	one x1
connector size	36 pins
connector data width (maximum)	1 PCI Express lane
PCI Express	
connector	one x4 (x8 connector wired as x4 electrically)
connector size	98 pins
connector data width (maximum)	4 PCI Express lanes
PCI Express	
connector	one x16
connector size	164 pins
connector data width (maximum)	16 PCI Express lanes

Drives	
Externally accessible:	two 3.5-inch drive bays (FlexBay)
	two 5.25-inch drive bays
Available devices	serial ATA hard drives, serial ATA DVD drive, and serial ATA DVD/CD-RW combo drive, floppy drive, Media Card Reader
Internally accessible:	two 3.5-inch hard-drive bays

Connectors	
External connectors:	
Video (external card)	15-pin VGA connector
	28-pin DVI connector
Network adapter	RJ-45 connector
USB	two front-panel and six back-panel USB 2.0-compliant connectors
Audio	seven back-panel connectors for line-in, line-out, microphone, surround, side surround, center/subwoofer Low Frequency Effects (LFE) channel, and S/PDIF; two front-panel connectors for headphones/microphone
System board connectors:	
Serial ATA	four 7-pin connectors
FlexBay Drive	USB 10-pin header for optional floppy drive or optional Media Card Reader (3.5-inch bay devices)
Fan	5-pin connector
PCI	three 120-pin connectors
PCI Express x1	36-pin connector
PCI Express x4 /x8	98-pin connector
PCI Express x16	164-pin connector
Thermal sensor 1x2	2-pin connector
PS/2 and serial port connector 2x12	24-pin connector

Controls and Lights	
Power control	push button
Power light	green light — Blinking green in sleep state; solid green for power-on state. amber light — Blinking amber indicates a problem with the power supply inside the computer. If the system cannot boot and there is a solid amber light, this indicates a problem with the system board (see "Power Problems" on page 71).
Hard-drive access light	green
Link integrity light (on integrated network adapter)	green light — A good connection exists between a 10-Mbps network and the computer. orange light — A good connection exists between a 100-Mbps network and the computer. off (no light) — The computer is not detecting a physical connection to the network.
Activity light (on integrated network adapter)	yellow light — Blinking indicates activity on the network.
Diagnostic lights	four lights on the front panel (see "Diagnostic Lights" on page 49)
Standby power light	AUXPWR on the system board

Power	
DC power supply:	
Wattage	375 W
Heat dissipation	1280 BTU/hr **NOTE:** Heat dissipation is calculated based upon the power supply wattage rating.
Voltage (see the safety instructions in the *Product Information Guide* for important voltage setting information)	Manual switched power supply: 90 to 135 V and 180 to 265 V at 50/60 Hz
Backup battery	3-V CR2032 lithium coin cell

Physical	
Height	46.05 cm (18.13 in)
Width	18.75 cm (7.38 in)
Depth	45.42 cm (17.88 in)
Weight	12.7 kg (28 lb)

Environmental	
Temperature:	
Operating	10° to 35°C (50° to 95°F)
Storage	–40° to 65°C (–40° to 149°F)
Relative humidity	20% to 80% (noncondensing)
Maximum vibration:	
Operating	0.25 G at 3 to 200 Hz at 0.5 octave/min
Storage	0.5 G at 3 to 200 Hz at 1 octave/min
Maximum shock:	
Operating	bottom half-sine pulse with a change in velocity of 20 inches/sec (50.8 cm/sec)
Storage	27-G faired square wave with a velocity change of 200 inches/sec (508 cm/sec)
Altitude:	
Operating	–15.2 to 3048 m (–50 to 10,000 ft)
Storage	–15.2 to 10,668 m (–50 to 35,000 ft)

System Setup

Overview

Use system setup as follows:

- To change the system configuration information after you add, change, or remove any hardware in your computer
- To set or change a user-selectable option such as the user password
- To read the current amount of memory or set the type of hard drive installed
- To flash the BIOS with an update

Before you use system setup, it is recommended that you write down the system setup screen information for future reference.

NOTICE: Unless you are an expert computer user, do not change the settings for this program. Certain changes can cause your computer to work incorrectly.

Entering System Setup

1. Turn on (or restart) your computer.
2. When the blue DELL™ logo is displayed, watch for the F2 prompt to appear.

3 Once the F2 prompt appears, press <F2> immediately.

NOTE: The F2 prompt indicates that the keyboard has initialized. If you press <F2> before you are prompted, the keystroke will be lost.

4 If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft® Windows® desktop, then shut down your computer (see "Turning Off Your Computer" on page 77) and try again.

System Setup Screens

The system setup screen displays current or changeable configuration information for your computer. Information on the screen is divided into three areas: the options list, active options field, and key functions.

<table>
<tr><td rowspan="2">**Options List** — This field appears on the left side of the system setup window. The field is a scrollable list containing features that define the configuration of your computer, including installed hardware, power conservation, and security features.

Scroll up and down the list with the up- and down-arrow keys. As an option is highlighted, the **Option Field** displays more information about that option and the option's current and available settings. By pressing <Enter> or the left- and right-arrow keys, you can toggle between a primary topic (collapsed) and subtopics (expanded).</td><td>**Option Field** — This field contains information about each option. In this field you can view and make changes to your current settings.

Use the right- and left-arrow keys to highlight an option. Press <Enter> to make that selection active.</td></tr>
<tr><td>**Key Functions** — This field appears below the **Option Field** and lists keys and their functions within the active system setup field.</td></tr>
</table>

System Setup Options

NOTE: Depending on your computer and installed devices, the items listed in this section may not appear, or may not appear exactly as listed.

System	
System Info	Lists system information such as the computer name, the BIOS version number and date, system tags, and other system-specific information. **NOTE:** The system name listed in the BIOS may not appear exactly as the name that appears on the computer or in the computer's documentation.
CPU Info	Lists the processor type, processor bus speed, processor ID, clock speed, L2 cache, and additional features supported by your processor.
Memory Info	Indicates the type and amount of installed memory, memory speed and channel mode (dual or single).
Date/Time	Displays current date and time settings.
Boot Sequence	The computer attempts to boot from the sequence of devices specified in this list. **NOTE:** If you insert a boot device and restart the computer, this option appears in the system setup menu. To boot from a USB memory device, select the USB device and move it (by pressing <U>) so that it becomes the first device in the list.

Drives	
Diskette Drive	Identifies and defines the floppy drive attached to the FLOPPY connector on the system board. The options restrict identification of drives to **USB only**, **Internal only**, or **none (Off)**. The **Read Only** option restricts the ability to boot from any floppy device.
SATA 0 through 5	Identifies the drives attached to the SATA connectors on the system board, and lists the capacity for hard drives.
SATA Operation	Identifies and defines the SATA controller settings for RAID. You can set the SATA controller to **RAID Autodetect/ATA** or **RAID On**.

Onboard Devices	
Integrated NIC	You can set the NIC to **On** (default), **Off**, or **On w/PXE**. When the **On w/PXE setting is active** (available only for the future boot process), the computer prompts you to press <Ctrl><Alt><b>. Pressing this key combination causes a menu to display that allows you to select a method for booting from a network server. If a boot routine is not available from the network server, the computer attempts to boot from the next device in the boot sequence list.

Integrated Audio	Enables or disables the onboard audio controller.
USB Controller	Set to **On** (default) so that USB devices will be detected and supported in the operating system.
USB for FlexBay	This field enables and disables the internal USB for FlexBay. • **Off** — Internal USB for FlexBay is disabled. • **On** — Internal USB for FlexBay is enabled. • **No Boot** — Internal USB for FlexBay is enabled but not bootable. The factory default setting is **No Boot**. **NOTE:** This USB option appears only if a FlexBay device is installed.
Rear Quad USB	Enables or disables the 4-stack of USB ports on the back of the computer.
Real Dual USB	Enables or disables the 2-stack of USB ports on the back of the computer.
Front USB	Enables or disables the 2-stack of USB ports on the front of the computer.
PS/2 mouse port	If your computer has the optional PS/2 mouse port, then this option is listed.

Video	
Primary Video	This setting specifies which video controller is primary when two video controllers are present on the computer.

Performance	
Multiple CPU Core	If your computer processor supports more than one core, this option appears in the Options List.
Virtualization	If your computer processor supports virtual technology, this option appears in the Options List.
SpeedStep	If your computer processor supports Intel® SpeedStep® technology, then this option is listed and it allows you to enable or disable support for this feature.
HyperThreading	If your computer processor supports Hyper-Threading, this option appears in the Options List.
HDD Acoustic Mode	• **Bypass (default)** — Your computer does not test or change the current acoustics mode setting. • **Quiet** — The hard drive operates at its most quiet setting. • **Suggested** — The hard drive operates at the level suggested by the drive manufacturer. • **Performance** — The hard drive operates at its maximum speed. **NOTE:** Switching to performance mode will cause the drive heads to move faster, causing the hard drive to be noisier. However, some drives may not see an increase in data transfer rates. **NOTE:** Changing the acoustics setting does not alter your hard drive image.

Security	
Admin Password	This option provides restricted access to the computer's system setup program in the same way that access to the system can be restricted with the **System Password** option.
System Password	Displays the current status of the system's password security feature and allows a new system password to be assigned and verified.
Password Status	This option locks the system password field with the setup password. When the field is locked, you can no longer disable password security by pressing <Ctrl><Enter> when the computer starts.
Execute Disable	Specifies whether Execute Disable Memory Protection Technology will be on or off.

Power Management	
AC Recovery	Determines what happens when AC power is restored to the computer.
Auto Power On	Sets the computer to automatically turn on. Choices are **every day** or every **Monday through Friday**. The default setting is **Off**. This feature does not work if you turn off your computer using a power strip or surge protector.
Auto Power Time	Sets time to automatically turn on the computer. Time is kept in the standard 12-hour format (*hours:minutes*). Change the startup time by pressing the right- or left-arrow key to increase or decrease the numbers, or type numbers in both the date and time fields. This feature does not work if you turn off your computer using a power strip or surge protector.
Remote Wake Up	This option allows the computer to power up when a NIC or Remote Wakeup-capable modem receives a wake up signal. **On** is the default setting. **On w/ Boot to NIC** allows the computer to attempt to boot from a network prior to using the boot sequence. **NOTE:** The system can be powered up remotely only from suspend mode.
Quick Resume	This feature enables/disables the Intel® Viiv™ Quick Resume Technology. The default setting is **Off**.

Maintenance	
Service Tag	Displays the system service tag which is a unique seven-digit alphanumeric system identifier.
SERR Message	Controls SERR message mechanism to support some add-in cards.
Load Defaults	Allows you to reset all options in the setup menu to the factory default.
Event Log	Displays the system event log.

POST Behavior	
Fastboot	When set to **On** (default), your computer starts more quickly because it skips certain configurations and tests.
Numlock Key	This option involves the rightmost bank of keys on your keyboard. When set to **On** (default), this option activates the numeric and mathematical features shown at the top of each key. When set to **Off**, this option activates the cursor-control functions labeled on the bottom of each key.
POST Hotkeys	This option allows you to specify the function keys to display on the screen when the computer starts.
Keyboard Errors	This option disables or enables keyboard error reporting when the computer starts.

Boot Sequence

This feature allows you to set the order in which the BIOS will search devices when trying to find an operating system.

NOTICE: If you modify any boot sequence settings, save the new settings to avoid losing the changes.

Option Settings

NOTE: The computer attempts to boot from all bootable devices, but if no bootable device is found, the computer generates an error message that states `No boot device available`. Press the <F1> key to retry the boot, or press the <F2> key to enter the setup utility.

- **Onboard or USB Floppy Drive —** The computer attempts to boot from the floppy drive. If there is no floppy in the drive or there is no floppy drive installed, the computer attempts to boot from the next bootable device in the sequence.

  NOTE: If there is a non-bootable floppy in the drive, the computer generates an error message. Follow the on-screen instructions to retry the boot.

- **Onboard SATA Hard Drive** — The computer attempts to boot from the primary hard drive. If no operating system is on the drive, the computer attempts to boot from the next bootable device.

- **Onboard or USB CD-ROM Drive** — The computer attempts to boot from the CD drive. If no CD is in the drive, or if the CD has no operating system, the computer attempts to boot from the next bootable device.
- **USB Device** — Insert the memory device into a USB port and restart the computer. When `F12 = Boot Menu` appears in the upper-right corner of the screen, press <F12>. The BIOS detects the device and adds the USB option to the boot menu.

  NOTE: To boot to a USB device, the device must be bootable. To ensure that your device is bootable, check the device documentation.

Changing Boot Sequence for the Current Boot

You can use this feature, for example, to restart your computer to a USB device such as a floppy drive, memory key, or CD-RW drive.

NOTE: If you are booting to a USB floppy drive, you must first set the floppy drive to OFF in system setup (see "System Setup Options" on page 129).

1. If you are booting to a USB device, connect the USB device to a USB connector (see "Front View of the Computer" on page 13).
2. Turn on (or restart) your computer.
3. When `F2 = Setup, F12 = Boot Menu` appears in the upper-right corner of the screen, press <F12>.

   If you wait too long and the operating system logo appears, continue to wait until you see the Microsoft Windows desktop, then shut down your computer (see "Turning Off Your Computer" on page 77) and try again.

   The **Boot Device Menu** appears, listing all available boot devices. Each device has a number next to it.
4. At the bottom of the menu, enter the number of the device that is to be used for the current boot only.

   For example, if you are booting to a USB memory key, highlight **USB Device** and press <Enter>.

   NOTE: To boot to a USB device, the device must be bootable. To make sure your device is bootable, check the device documentation.

Changing Boot Sequence for Future Boots

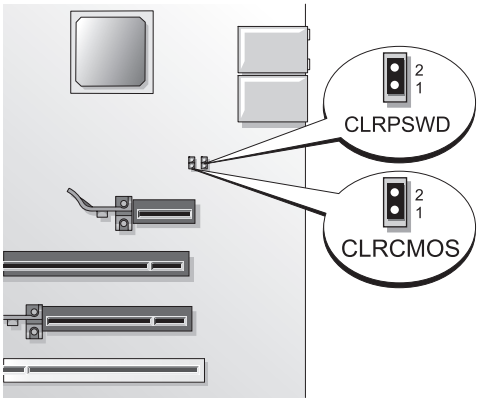
1. Enter system setup (see "Entering System Setup" on page 127).
2. Use the arrow keys to highlight the **Boot Sequence** menu option, then press <Enter> to access the menu.

   NOTE: Write down your current boot sequence in case you want to restore it.
3. Press the up- and down-arrow keys to move through the list of devices.
4. Press the spacebar to enable or disable a device. Enabled devices have a number assigned to them; disabled devices have no number assigned.
5. Press <U> or <D> to move a selected device up or down the list.

Clearing Forgotten Passwords

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

1 Follow the procedures in "Before Working Inside Your Computer" on page 78.



2 Locate the 2-pin password jumper (CLRPSWD) on the system board (see "System Board Components" on page 81), and remove the jumper to clear the password.

NOTE: When you receive your computer, the jumper plug is attached to pins 1 and 2.

3 Replace the computer cover (see "Replacing the Computer Cover" on page 121).

4 Connect your computer and monitor to electrical outlets, and then turn them on.

5 After the Microsoft® Windows® desktop appears on your computer, shut down the computer (see "Turning Off Your Computer" on page 77).

6 Turn off the monitor and disconnect it from the electrical outlet.

7 Disconnect the computer power cable from the electrical outlet, then press the power button to ground the system board.

8 Remove the computer cover (see "Removing the Computer Cover" on page 78).

9 Locate the 2-pin password jumper (CLRPSWD) on the system board (see "System Board Components" on page 81) and attach the jumper to pins 1 and 2 to reenable the password feature.

10 Replace the computer cover (see "Replacing the Computer Cover" on page 121).

NOTICE: To connect a network cable, first plug the cable into the network device and then plug it into the computer.

11 Connect your computer and devices to electrical outlets, and then turn them on.

Clearing CMOS Settings

CAUTION: Before you perform any of the procedures in this section, follow the safety instructions in the *Product Information Guide*.

1. Follow the procedures in "Before You Begin" on page 77.
2. Reset the current CMOS settings:
   a. Locate the 2-pin CMOS jumper (CLRCMOS) on the system board (see "System Board Components" on page 81).

   NOTE: When you receive your computer, there is no jumper plug on the CMOS jumper.

   b. Remove the jumper plug from the password jumper (CLRPSWD) pins 1 and 2.
   c. Place the jumper plug on the CMOS jumper (CLRCMOS) pins 1 and 2 and wait approximately five seconds.
   d. Remove the jumper plug and replace it on the password jumper (CLRPSWD) pins 1 and 2.
3. Replace the computer cover (see "Replacing the Computer Cover" on page 121).

NOTICE: To connect a network cable, first plug the cable into the network wall jack and then plug it into the computer.

4. Connect your computer and devices to electrical outlets, and then turn them on.

Dell Technical Support Policy (U.S. Only)

Technician-assisted technical support requires the cooperation and participation of the customer in the troubleshooting process and provides for restoration of the operating system, software programs, and hardware drivers to the original default configuration as shipped from Dell, as well as the verification of appropriate functionality of the computer and all Dell-installed hardware. In addition to this technician-assisted technical support, online technical support is available at **support.dell.com**. Additional technical support options may be available for purchase.

Dell provides limited technical support for the computer and any "Dell-installed" software and peripherals[1]. Support for third-party software and peripherals is provided by the original manufacturer, including those purchased and/or installed through Dell Software and Peripherals, Readyware, and Custom Factory Integration[2].

[1] Repair services are provided pursuant to the terms and conditions of your limited warranty and any optional support service contract purchased with the computer.

[2] All Dell-standard components included in a Custom Factory Integration (CFI) project are covered by the standard Dell limited warranty for your computer. However, Dell also extends a parts replacement program to cover all nonstandard, third-party hardware components integrated through CFI for the duration of the computer's service contract.

Definition of "Dell-Installed" Software and Peripherals

Dell-installed software includes the operating system and some of the software programs that are installed on the computer during the manufacturing process (Microsoft® Office, Norton Antivirus, etc.).

Dell-installed peripherals include any internal expansion cards, or Dell-branded module bay or PC Card accessories. In addition, any Dell-branded monitors, keyboards, mice, speakers, microphones for telephonic modems, docking stations/port replicators, networking products, and all associated cabling are included.

Definition of "Third-Party" Software and Peripherals

Third-party software and peripherals include any peripheral, accessory, or software program sold by Dell not under the Dell brand (printers, scanners, cameras, games, etc.). Support for all third-party software and peripherals is provided by the original manufacturer of the product.

FCC Notice (U.S. Only)

FCC Class B

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the manufacturer's instruction manual, may cause interference with radio and television reception. This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

NOTICE: The FCC regulations provide that changes or modifications not expressly approved by Dell Inc. could void your authority to operate this equipment.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference with radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna.
- Relocate the system with respect to the receiver.
- Move the system away from the receiver.
- Plug the system into a different outlet so that the system and the receiver are on different branch circuits.

If necessary, consult a representative of Dell Inc. or an experienced radio/television technician for additional suggestions.

The following information is provided on the device or devices covered in this document in compliance with the FCC regulations:

- Product name: Dell™ XPS™ 410
- Model number: DCTA
- Company name:
  Dell Inc.
  Worldwide Regulatory Compliance & Environmental Affairs
  One Dell Way
  Round Rock, TX 78682 USA
  512-338-4400

NOTE: For Further regulatory information, see your *Product Information Guide*.

Contacting Dell

To contact Dell electronically, you can access the following websites:

- **www.dell.com**
- **support.dell.com** (support)

For specific web addresses for your country, find the appropriate country section in the table below.

NOTE: Toll-free numbers are for use within the country for which they are listed.

NOTE: In certain countries, support specific to Dell™ XPS™ computers is available at a separate telephone number listed for participating countries. If you do not see a telephone number listed that is specific for XPS computers, you may contact Dell through the support number listed and your call will be routed appropriately.

When you need to contact Dell, use the electronic addresses, telephone numbers, and codes provided in the following table. If you need assistance in determining which codes to use, contact a local or an international operator.

NOTE: The contact information provided was deemed correct at the time that this document went to print and is subject to change.

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Anguilla	Website: **www.dell.com.ai**	
	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 800-335-0031
Antigua and Barbuda	Website: **www.dell.com.ag**	
	E-mail: la-techsupport@dell.com	
	Technical Support	1-800-805-5924
Aomen	Technical Support (Dell™ Dimension™, Dell Inspiron™, Dell OptiPlex™, Dell Latitude™, and Dell Precision™)	0800-105
	Technical Support (servers and storage)	0800-105
Argentina (Buenos Aires) International Access Code: **00** Country Code: **54** City Code: **11**	Website: **www.dell.com.ar** E-mail: la-techsupport@dell.com E-mail for desktop and portable computers: la-techsupport@dell.com E-mail for servers and EMC® storage products: la_enterprise@dell.com	
	Customer Care	toll-free: 0-800-444-0730
	Technical Support	toll-free: 800-222-0154
	Technical Support Services	toll-free: 0-800-444-0724
	Sales	0-810-444-3355
Aruba	Website: **www.dell.com.aw**	
	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 800-1578
Australia (Sydney) International Access Code: **0011** Country Code: **61** City Code: **2**	Website: support.ap.dell.com E-mail: support.ap.dell.com/contactus General Support	13DELL-133355

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Austria	Website: **support.euro.dell.com**	
International Access Code: **900**	E-mail: tech_support_central_europe@dell.com	
	Home/Small Business Sales	0820 240 530 00
	Home/Small Business Fax	0820 240 530 49
	Home/Small Business Customer Care	0820 240 530 14
	Preferred Accounts/Corporate Customer Care	0820 240 530 16
	Support for XPS	0820 240 530 81
	Home/Small Business Support for all other Dell computers	0820 240 530 17
	Preferred Accounts/Corporate Support	0820 240 530 17
	Switchboard	0820 240 530 00
Bahamas	Website: **www.dell.com.bs**	
	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 1-866-874-3038
Barbados	Website: www.dell.com/bb	
	E-mail: la-techsupport@dell.com	
	Technical Support	1-800-534-3142
Belgium (Brussels)	Website: **support.euro.dell.com**	
International Access Code: **00**	Tech Support for XPS	02 481 92 96
Country Code: **32**	Tech Support for all other Dell computers	02 481 92 88
City Code: **2**	Tech Support Fax	02 481 92 95
	Customer Care	02 713 15 65
	Corporate Sales	02 481 91 00
	Fax	02 481 92 99
	Switchboard	02 481 91 00
Bermuda	Website: www.dell.com/bm	
	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 1-877-890-0754
Bolivia	Website: www.dell.com/bo	
	E-mail: la-techsupport@dell.com	
	General Support	toll-free: 800-10-0238

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Brazil	Website: **www.dell.com/br**	
International Access Code: **00**	E-mail: BR-TechSupport@dell.com	
Country Code: **55**	Customer Care and Tech Support	0800 90 3355
City Code: **51**	Technical Support Fax	51 2104 5470
	Customer Care Fax	51 2104 5480
	Sales	0800 722 3498
British Virgin Islands	General Support	toll-free: 1-866-278-6820
Brunei	Technical Support (Penang, Malaysia)	604 633 4966
Country Code: **673**	Customer Care (Penang, Malaysia)	604 633 4888
	Transaction Sales (Penang, Malaysia)	604 633 4955
Canada (North York, Ontario)	Online Order Status: **www.dell.ca/ostatus**	
International Access Code: **011**	AutoTech (automated Hardware and Warranty Support)	toll-free: 1-800-247-9362
	Customer Service (Home/Home Office)	toll-free: 1-800-847-4096
	Customer Service (small/med./large business, government)	toll-free: 1-800-387-5757
	Customer Service (printers, projectors, televisions, handhelds, digital jukebox, and wireless)	toll-free: 1-800-847-4096
	Hardware Warranty Phone Support (Home/Home Office)	toll-free: 1-800-847-4096
	Hardware Warranty Phone Support (small/med./large business, government)	toll-free: 1-800-387-5757
	Hardware Warranty Phone Support (printers, projectors, televisions, handhelds, digital jukebox, and wireless)	1-877-335-5767
	Sales (Home Sales/Small Business)	toll-free: 1-800-387-5752
	Sales (med./large bus., government)	toll-free: 1-800-387-5755
	Spare Parts Sales & Extended Service Sales	1 866 440 3355
Cayman Islands	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 1-877-261-0242

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Chile (Santiago)	Website: **www.dell.com/cl**	
Country Code: **56**	E-mail: la-techsupport@dell.com	
City Code: **2**	Sales and Customer Support	toll-free: 1230-020-4823
	Technical Support (CTC)	toll-free: 800730222
	Technical Support (ENTEL)	toll-free: 1230-020-3762
China (Xiamen)	Technical Support website: **support.dell.com.cn**	
Country Code: **86**	Technical Support E-mail: cn_support@dell.com	
City Code: **592**	Customer Care E-mail: customer_cn@dell.com	
	Technical Support Fax	592 818 1350
	Technical Support (Dimension and Inspiron)	toll-free: 800 858 2969
	Technical Support (OptiPlex, Latitude, and Dell Precision)	toll-free: 800 858 0950
	Technical Support (servers and storage)	toll-free: 800 858 0960
	Technical Support (projectors, PDAs, switches, routers, and so on)	toll-free: 800 858 2920
	Technical Support (printers)	toll-free: 800 858 2311
	Customer Care	toll-free: 800 858 2060
	Customer Care Fax	592 818 1308
	Home and Small Business	toll-free: 800 858 2222
	Preferred Accounts Division	toll-free: 800 858 2557
	Large Corporate Accounts GCP	toll-free: 800 858 2055
	Large Corporate Accounts Key Accounts	toll-free: 800 858 2628
	Large Corporate Accounts North	toll-free: 800 858 2999
	Large Corporate Accounts North Government and Education	toll-free: 800 858 2955
	Large Corporate Accounts East	toll-free: 800 858 2020
	Large Corporate Accounts East Government and Education	toll-free: 800 858 2669
	Large Corporate Accounts Queue Team	toll-free: 800 858 2572
	Large Corporate Accounts South	toll-free: 800 858 2355
	Large Corporate Accounts West	toll-free: 800 858 2811
	Large Corporate Accounts Spare Parts	toll-free: 800 858 2621

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Colombia	Website: **www.dell.com/cl**	
	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 1-800-915-5704
Costa Rica	Website: **www.dell.com/cr**	
	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 800-012-0232
Czech Republic (Prague)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: czech_dell@dell.com	
Country Code: **420**	Technical Support	22537 2727
	Customer Care	22537 2707
	Fax	22537 2714
	Technical Fax	22537 2728
	Switchboard	22537 2711
Denmark (Copenhagen)	Website: **support.euro.dell.com**	
International Access Code: **00**	Technical Support for XPS	7010 0074
Country Code: **45**	Technical Support for all other Dell computers	7023 0182
	Customer Care (Relational)	7023 0184
	Home/Small Business Customer Care	3287 5505
	Switchboard (Relational)	3287 1200
	Switchboard Fax (Relational)	3287 1201
	Switchboard (Home/Small Business)	3287 5000
	Switchboard Fax (Home/Small Business)	3287 5001
Dominica	Website: **www.dell.com/dm**	
	E-mail: la-techsupport@dell.com	
	General Support	toll-free: 1-866-278-6821
Dominican Republic	Website: **www.dell.com/do**	
	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 1-888-156-1834 or toll-free: 1-888-156-1584

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Ecuador	Website: **www.dell.com/ec**	
	E-mail: la-techsupport@dell.com	
	General Support (calling from Quito)	toll-free: 999-119-877-655-3355
	General Support (calling from Guayaquil)	toll-free: 1800-999-119-877-655-3355
El Salvador	Website: **www.dell.com/ec**	
	E-mail: la-techsupport@dell.com	
	Technical Support (Telephonica)	toll-free: 8006170
Finland (Helsinki)	Website: **support.euro.dell.com**	
International Access Code: **990**	E-mail: fi_support@dell.com	
Country Code: **358**	Technical Support	0207 533 555
City Code: **9**	Customer Care	0207 533 538
	Switchboard	0207 533 533
	Sales under 500 employees	0207 533 540
	Fax	0207 533 530
	Sales over 500 employees	0207 533 533
	Fax	0207 533 530

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
France (Paris) (Montpellier)	Website: **support.euro.dell.com**	
International Access Code: **00**	**Home and Small Business**	
Country Code: **33**	Technical Support for XPS	0825 387 129
City Codes: **(1) (4)**	Technical Support for all other Dell computers	0825 387 270
	Customer Care	0825 823 833
	Switchboard	0825 004 700
	Switchboard (calls from outside of France)	04 99 75 40 00
	Sales	0825 004 700
	Fax	0825 004 701
	Fax (calls from outside of France)	04 99 75 40 01
	Corporate	
	Technical Support	0825 004 719
	Customer Care	0825 338 339
	Switchboard	01 55 94 71 00
	Sales	01 55 94 71 00
	Fax	01 55 94 71 01
Germany (Frankfurt)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: tech_support_central_europe@dell.com	
Country Code: **49**	Technical Support for XPS	069 9792 7222
City Code: **69**	Technical Support for all other Dell computers	069 9792-7200
	Home/Small Business Customer Care	0180-5-224400
	Global Segment Customer Care	069 9792-7320
	Preferred Accounts Customer Care	069 9792-7320
	Large Accounts Customer Care	069 9792-7320
	Public Accounts Customer Care	069 9792-7320
	Switchboard	069 9792-7000

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Greece	Website: **support.euro.dell.com**	
International Access Code: **00**	Technical Support	00800-44 14 95 18
Country Code: **30**	Gold Service Technical Support	00800-44 14 00 83
	Switchboard	2108129810
	Gold Service Switchboard	2108129811
	Sales	2108129800
	Fax	2108129812
Grenada	E-mail: la-techsupport@dell.com	
	General Support	toll-free: 1-866-540-3355
Guatemala	E-mail: la-techsupport@dell.com	
	General Support	1-800-999-0136
Guyana	E-mail: la-techsupport@dell.com	
	General Support	toll-free: 1-877-270-4609
Hong Kong	Website: support.ap.dell.com	
International Access Code: **001**	Technical Support E-mail: HK_support@Dell.com	
Country Code: **852**	Technical Support (Dimension and Inspiron)	00852-2969 3188
	Technical Support (OptiPlex, Latitude, and Dell Precision)	00852-2969 3191
	Technical Support (servers and storage)	00852-2969 3196
	Technical Support (projectors, PDAs, switches, routers, and so on)	00852-3416 0906
	Customer Care	00852-3416 0910
	Large Corporate Accounts	00852-3416 0907
	Global Customer Programs	00852-3416 0908
	Medium Business Division	00852-3416 0912
	Home and Small Business Division	00852-2969 3105

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
India	E-mail: india_support_desktop@dell.com india_support_notebook@dell.com india_support_Server@dell.com	
	Technical Support	1600338045
		and 1600448046
	Sales (Large Corporate Accounts)	1600 33 8044
	Sales (Home and Small Business)	1600 33 8046
Ireland (Cherrywood)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: dell_direct_support@dell.com	
Country Code: **353**	**Sales**	
City Code: **1**	Ireland Sales	01 204 4444
	Dell Outlet	1850 200 778
	Online Ordering HelpDesk	1850 200 778
	Customer Care	
	Home User Customer Care	01 204 4014
	Small Business Customer Care	01 204 4014
	Corporate Customer Care	1850 200 982
	Technical Support	
	Technical Support for XPS computers only	1850 200 722
	Technical Support for all other Dell computers	1850 543 543
	General	
	Fax/Sales Fax	01 204 0103
	Switchboard	01 204 4444
	U.K. Customer Care (dial within U.K. only)	0870 906 0010
	Corporate Customer Care (dial within U.K. only)	0870 907 4499
	U.K. Sales (dial within U.K. only)	0870 907 4000

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Italy (Milan)	Website: **support.euro.dell.com**	
International Access Code: **00**	**Home and Small Business**	
Country Code: **39**	Technical Support	02 577 826 90
City Code: **02**	Customer Care	02 696 821 14
	Fax	02 696 821 13
	Switchboard	02 696 821 12
	Corporate	
	Technical Support	02 577 826 90
	Customer Care	02 577 825 55
	Fax	02 575 035 30
	Switchboard	02 577 821
Jamaica	E-mail: la-techsupport@dell.com	
	Technical Support (dial from within Jamaica only)	toll-free: 1-800-326-6061 or toll-free: 1-800-975-1646

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Japan (Kawasaki)	Website: **support.jp.dell.com**	
International Access Code: **001**	Technical Support (servers)	toll-free: 0120-198-498
Country Code: **81**	Technical Support outside of Japan (servers)	81-44-556-4162
City Code: **44**	Technical Support (Dimension and Inspiron)	toll-free: 0120-198-226
	Technical Support outside of Japan (Dimension and Inspiron)	81-44-520-1435
	Technical Support (Dell Precision, OptiPlex, and Latitude)	toll-free:0120-198-433
	Technical Support outside of Japan (Dell Precision, OptiPlex, and Latitude)	81-44-556-3894
	Technical Support (PDAs, projectors, printers, routers)	toll-free: 0120-981-690
	Technical Support outside of Japan (PDAs, projectors, printers, routers)	81-44-556-3468
	Faxbox Service	044-556-3490
	24-Hour Automated Order Status Service	044-556-3801
	Customer Care	044-556-4240
	Business Sales Division (up to 400 employees)	044-556-1465
	Preferred Accounts Division Sales (over 400 employees)	044-556-3433
	Public Sales (government agencies, educational institutions, and medical institutions)	044-556-5963
	Global Segment Japan	044-556-3469
	Individual User	044-556-1760
	Switchboard	044-556-4300
Korea (Seoul)	E-mail: krsupport@dell.com	
International Access Code: **001**	Support	toll-free: 080-200-3800
Country Code: **82** City Code: **2**	Support (Dimension, PDA, Electronics and Accessories)	toll-free: 080-200-3801
	Sales	toll-free: 080-200-3600
	Fax	2194-6202
	Switchboard	2194-6000

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Latin America	Customer Technical Support (Austin, Texas, U.S.A.)	512 728-4093
	Customer Service (Austin, Texas, U.S.A.)	512 728-3619
	Fax (Technical Support and Customer Service) (Austin, Texas, U.S.A.)	512 728-3883
	Sales (Austin, Texas, U.S.A.)	512 728-4397
	SalesFax (Austin, Texas, U.S.A.)	512 728-4600
		or 512 728-3772
Luxembourg	Website: **support.euro.dell.com**	
International Access Code: **00**	Support	342 08 08 075
Country Code: **352**	Home/Small Business Sales	+32 (0)2 713 15 96
	Corporate Sales	26 25 77 81
	Customer Care	+32 (0)2 481 91 19
	Fax	26 25 77 82
Macao	Technical Support	toll-free: 0800 105
Country Code: **853**	Customer Service (Xiamen, China)	34 160 910
	Transaction Sales (Xiamen, China)	29 693 115
Malaysia (Penang)	Website: **support.ap.dell.com**	
International Access Code: **00**	Technical Support (Dell Precision, OptiPlex, and Latitude)	toll-free: 1 800 880 193
Country Code: **60**		
City Code: **4**	Technical Support (Dimension, Inspiron, and Electronics and Accessories)	toll-free: 1 800 881 306
	Technical Support (PowerApp, PowerEdge, PowerConnect, and PowerVault)	toll-free: 1800 881 386
	Customer Care	toll-free: 1800 881 306 (option 6)
	Transaction Sales	toll-free: 1 800 888 202
	Corporate Sales	toll-free: 1 800 888 213

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Mexico	E-mail: la-techsupport@dell.com	
International Access Code: **00**	Technical Support (TelMex)	toll-free: 1-866-563-4425
Country Code: **52**	Sales	50-81-8800
		or 01-800-888-3355
	Customer Service	001-877-384-8979
		or 001-877-269-3383
	Main	50-81-8800
		or 01-800-888-3355
Montserrat	E-mail: la-techsupport@dell.com	
	General Support	toll-free: 1-866-278-6822
Netherlands Antilles	E-mail: la-techsupport@dell.com	
	General Support	001-800-882-1519
Netherlands (Amsterdam)	Website: **support.euro.dell.com**	
International Access Code: **00**	Technical Support for XPS	020 674 45 94
Country Code: **31**	Technical Support for all other Dell computers	020 674 45 00
City Code: **20**	Technical Support Fax	020 674 47 66
	Home/Small Business Customer Care	020 674 42 00
	Relational Customer Care	020 674 4325
	Home/Small Business Sales	020 674 55 00
	Relational Sales	020 674 50 00
	Home/Small Business Sales Fax	020 674 47 75
	Relational Sales Fax	020 674 47 50
	Switchboard	020 674 50 00
	Switchboard Fax	020 674 47 50
New Zealand	Website: **support.ap.dell.com**	
International Access Code: **00**	E-mail: support.ap.dell.com/contactus	
Country Code: **64**	General Support	0800 441 567
Nicaragua	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 1-800-220-1378

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Norway (Lysaker)	Website: **support.euro.dell.com**	
International Access Code: **00**	Technical Support for XPS	815 35 043
Country Code: **47**	Technical Support for all other Dell products	671 16882
	Relational Customer Care	671 17575
	Home/Small Business Customer Care	23162298
	Switchboard	671 16800
	Fax Switchboard	671 16865
Panama	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 1-800-507-1385
	Technical Support (CLARACOM)	toll-free: 1-866-633-4097
Peru	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 0800-50-869
Poland (Warsaw)	Website: **support.euro.dell.com**	
International Access Code: **011**	E-mail: pl_support_tech@dell.com	
Country Code: **48**	Customer Service Phone	57 95 700
City Code: **22**	Customer Care	57 95 999
	Sales	57 95 999
	Customer Service Fax	57 95 806
	Reception Desk Fax	57 95 998
	Switchboard	57 95 999
Portugal	Website: **support.euro.dell.com**	
International Access Code: **00**	Technical Support	707200149
Country Code: **351**	Customer Care	800 300 413
	Sales	800 300 410 or 800 300 411 or 800 300 412 or 21 422 07 10
	Fax	21 424 01 12
Puerto Rico	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 1-866-390-4695
St. Kitts and Nevis	Website: **www.dell.com/kn**	
	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 1-866-540-3355

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
St. Lucia	Website: **www.dell.com/lc**	
	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 1-866-464-4352
St. Vincent and the Grenadines	Website: **www.dell.com/vc**	
	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 1-866-464-4353
Singapore (Singapore) International Access Code: **005** Country Code: **65**	**NOTE:** The phone numbers in this section should be called from within Singapore or Malaysia only.	
	Website: **support.ap.dell.com**	
	Technical Support (Dimension, Inspiron, and Electronics and Accessories)	toll-free: 1 800 394 7430
	Technical Support (OptiPlex, Latitude, and Dell Precision)	toll-free: 1 800 394 7488
	Technical Support (PowerApp, PowerEdge, PowerConnect, and PowerVault)	toll-free: 1 800 394 7478
	Customer Care	toll-free: 1 800 394 7430 (option 6)
	Transaction Sales	toll-free: 1 800 394 7412
	Corporate Sales	toll-free: 1 800 394 7419
Slovakia (Prague) International Access Code: **00** Country Code: **421**	Website: **support.euro.dell.com**	
	E-mail: czech_dell@dell.com	
	Technical Support	02 5441 5727
	Customer Care	420 22537 2707
	Fax	02 5441 8328
	Tech Fax	02 5441 8328
	Switchboard (Sales)	02 5441 7585

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
South Africa (Johannesburg)	Website: **support.euro.dell.com**	
International Access Code:	E-mail: dell_za_support@dell.com	
09/091	Gold Queue	011 709 7713
Country Code: **27**	Technical Support	011 709 7710
City Code: **11**	Customer Care	011 709 7707
	Sales	011 709 7700
	Fax	011 706 0495
	Switchboard	011 709 7700
Southeast Asian and Pacific Countries	Technical Support, Customer Service, and Sales (Penang, Malaysia)	604 633 4810
Spain (Madrid)	Website: **support.euro.dell.com**	
International Access Code: **00**	**Home and Small Business**	
Country Code: **34**	Technical Support	902 100 130
City Code: **91**	Customer Care	902 118 540
	Sales	902 118 541
	Switchboard	902 118 541
	Fax	902 118 539
	Corporate	
	Technical Support	902 100 130
	Customer Care	902 115 236
	Switchboard	91 722 92 00
	Fax	91 722 95 83
Sweden (Upplands Vasby)	Website: **support.euro.dell.com**	
International Access Code: **00**	Technical Support for XPS	0771 340 340
Country Code: **46**	Technical Support for all other Dell products	08 590 05 199
City Code: 8	Relational Customer Care	08 590 05 642
	Home/Small Business Customer Care	08 587 70 527
	Employee Purchase Program (EPP) Support	020 140 14 44
	Technical Support Fax	08 590 05 594
	Sales	08 590 05 185

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Switzerland (Geneva)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: Tech_support_central_Europe@dell.com	
Country Code: **41**	Technical Support for XPS	0848 33 88 57
City Code: **22**	Technical Support (Home and Small Business) for all other Dell products	0844 811 411
	Technical Support (Corporate)	0844 822 844
	Customer Care (Home and Small Business)	0848 802 202
	Customer Care (Corporate)	0848 821 721
	Fax	022 799 01 90
	Switchboard	022 799 01 01
Taiwan	Website: **support.ap.dell.com**	
International Access Code: **002**	E-mail: ap_support@dell.com	
Country Code: **886**	Technical Support (OptiPlex, Latitude, Inspiron, Dimension, and Electronics and Accessories)	toll-free: 0080 186 1011
	Technical Support (servers and storage)	toll-free: 0080 160 1256
	Customer Care	toll-free: 0080 160 1250 (option 5)
	Transaction Sales	toll-free: 0080 165 1228
	Corporate Sales	toll-free: 0080 165 1227
Thailand	Website: **support.ap.dell.com**	
International Access Code: **001** Country Code: **66**	Technical Support (OptiPlex, Latitude, and Dell Precision)	toll-free: 1800 0060 07
	Technical Support (PowerApp, PowerEdge, PowerConnect, and PowerVault)	toll-free: 1800 0600 09
	Customer Care	toll-free: 1800 006 007 (option 7)
	Corporate Sales	toll-free: 1800 006 009
	Transaction Sales	toll-free: 1800 006 006
Trinidad/Tobago	Website: **www.dell.com/tt**	
	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 1-888-799-5908

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
Turks and Caicos Islands	Website: **www.dell.com/tc**	
	E-mail: la-techsupport@dell.com	
	General Support	toll-free: 1-877-441-4735
U.K. (Bracknell)	Website: **support.euro.dell.com**	
International Access Code: **00**	E-mail: dell_direct_support@dell.com	
Country Code: **44**	Customer Care website:	
City Code: **1344**	**support.euro.dell.com/uk/en/ECare/form/home.asp**	
	Sales	
	Home and Small Business Sales	0870 907 4000
	Corporate/Public Sector Sales	01344 860 456
	Customer Care	
	Home and Small Business Customer Care	0870 906 0010
	Corporate Customer Care	01344 373 185
	Preferred Accounts (500–5000 employees)	0870 906 0010
	Global Accounts Customer Care	01344 373 186
	Central Government Customer Care	01344 373 193
	Local Government & Education Customer Care	01344 373 199
	Health Customer Care	01344 373 194
	Technical Support	
	Technical Support for XPS computers only	0870 366 4180
	Technical Support (Corporate/Preferred Accounts/PAD [1000+ employees])	0870 908 0500
	Technical Support for all other products	0870 353 0800
	General	
	Home and Small Business Fax	0870 907 4006
Uruguay	Website: **www.dell.com/uy**	
	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 413-598-2522

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
U.S.A. (Austin, Texas)	Automated Order-Status Service	toll-free: 1-800-433-9014
International Access Code: **011**	AutoTech (portable and desktop computers)	toll-free: 1-800-247-9362
Country Code: **1**	Hardware and Warranty Support (Dell TV, Printers, and Projectors) for Relationship customers	toll-free: 1-877-459-7298
	Americas Consumer XPS Support	toll-free: 1-800-232-8544
	Consumer (Home and Home Office) Support for all other Dell products	toll-free: 1-800-624-9896
	Customer Service	toll-free: 1-800-624-9897
	Employee Purchase Program (EPP) Customers	toll-free: 1-800-695-8133
	Financial Services website: **www.dellfinancialservices.com**	
	Financial Services (lease/loans)	toll-free: 1-877-577-3355
	Financial Services (Dell Preferred Accounts [DPA])	toll-free: 1-800-283-2210
	Business	
	Customer Service and Support	toll-free: 1-800-456-3355
	Employee Purchase Program (EPP) Customers	toll-free: 1-800-695-8133
	Support for printers, projectors, PDAs, and MP3 players	toll-free: 1-877-459-7298
	Public (government, education, and healthcare)	
	Customer Service and Support	toll-free: 1-800-456-3355
	Employee Purchase Program (EPP) Customers	toll-free: 1-800-695-8133
	Dell Sales	toll-free: 1-800-289-3355 or toll-free: 1-800-879-3355
	Dell Outlet Store (Dell refurbished computers)	toll-free: 1-888-798-7561
	Software and Peripherals Sales	toll-free: 1-800-671-3355
	Spare Parts Sales	toll-free: 1-800-357-3355
	Extended Service and Warranty Sales	toll-free: 1-800-247-4618
	Fax	toll-free: 1-800-727-8320
	Dell Services for the Deaf, Hard-of-Hearing, or Speech-Impaired	toll-free: 1-877-DELLTTY (1-877-335-5889)

Country (City) International Access Code Country Code City Code	Department Name or Service Area, Website and E-Mail Address	Area Codes, Local Numbers, and Toll-Free Numbers
U.S. Virgin Islands	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 1-877-702-4360
Venezuela	Website: **www.dell.com/ve**	
	E-mail: la-techsupport@dell.com	
	Technical Support	toll-free: 0800-100-2513

Glossary

Terms in this Glossary are provided for informational purposes only and may or may not describe features included with your particular computer.

A

AC — alternating current — The form of electricity that powers your computer when you plug the AC adapter power cable in to an electrical outlet.

ACPI — advanced configuration and power interface — A power management specification that enables Microsoft® Windows® operating systems to put a computer in standby or hibernate mode to conserve the amount of electrical power allocated to each device attached to the computer.

AGP — accelerated graphics port — A dedicated graphics port that allows system memory to be used for video-related tasks. AGP delivers a smooth, true-color video image because of the faster interface between the video circuitry and the computer memory.

AHCI — Advanced Host Controller Interface — An interface for a SATA hard drive Host Controller which allows the storage driver to enable technologies such as Native Command Queuing (NCQ) and hot plug.

ALS — ambient light sensor — A feature that helps to control display brightness.

antivirus software — A program designed to identify, quarantine, and/or delete viruses from your computer.

ASF — alert standards format — A standard to define a mechanism for reporting hardware and software alerts to a management console. ASF is designed to be platform- and operating system-independent.

B

battery life span — The length of time (years) during which a portable computer battery is able to be depleted and recharged.

battery operating time — The length of time (minutes or hours) that a portable computer battery powers the computer.

BIOS — basic input/output system — A program (or utility) that serves as an interface between the computer hardware and the operating system. Unless you understand what effect these settings have on the computer, do not change them. Also referred to as *system setup*.

bit — The smallest unit of data interpreted by your computer.

Bluetooth® wireless technology — A wireless technology standard for short-range (9 m [29 feet]) networking devices that allows for enabled devices to automatically recognize each other.

boot sequence — Specifies the order of the devices from which the computer attempts to boot.

bootable CD — A CD that you can use to start your computer. In case your hard drive is damaged or your computer has a virus, ensure that you always have a bootable CD or floppy disk available. Your *Drivers and Utilities* (or *ResourceCD*) is a bootable CD.

bootable disk — A disk that you can use to start your computer. In case your hard drive is damaged or your computer has a virus, ensure that you always have a bootable CD or floppy disk available.

bps — bits per second — The standard unit for measuring data transmission speed.

BTU — British thermal unit — A measurement of heat output.

bus — A communication pathway between the components in your computer.

bus speed — The speed, given in MHz, that indicates how fast a bus can transfer information.

byte — The basic data unit used by your computer. A byte is usually equal to 8 bits.

C

C — Celsius — A temperature measurement scale where 0° is the freezing point and 100° is the boiling point of water.

cache — A special high-speed storage mechanism which can be either a reserved section of main memory or an independent high-speed storage device. The cache enhances the efficiency of many processor operations.

L1 cache — Primary cache stored inside the processor.

L2 cache — Secondary cache which can either be external to the processor or incorporated into the processor architecture.

carnet — An international customs document that facilitates temporary imports into foreign countries. Also known as a *merchandise passport*.

CD-R — CD recordable — A recordable version of a CD. Data can be recorded only once onto a CD-R. Once recorded, the data cannot be erased or written over.

CD-RW — CD rewritable — A rewritable version of a CD. Data can be written to a CD-RW disc, and then erased and written over (rewritten).

CD-RW drive — A drive that can read CDs and write to CD-RW (rewritable CDs) and CD-R (recordable CDs) discs. You can write to CD-RW discs multiple times, but you can write to CD-R discs only once.

CD-RW/DVD drive — A drive, sometimes referred to as a combo drive, that can read CDs and DVDs and write to CD-RW (rewritable CDs) and CD-R (recordable CDs) discs. You can write to CD-RW discs multiple times, but you can write to CD-R discs only once.

clock speed — The speed, given in MHz, that indicates how fast computer components that are connected to the system bus operate.

COA — Certificate of Authenticity — The Windows alpha-numeric code located on a sticker on your computer. Also referred to as the *Product Key* or *Product ID*.

Control Panel — A Windows utility that allows you to modify operating system and hardware settings, such as display settings.

controller — A chip that controls the transfer of data between the processor and memory or between the processor and devices.

CRIMM — continuity rambus in-line memory module — A special module that has no memory chips and is used to fill unused RIMM slots.

cursor — The marker on a display or screen that shows where the next keyboard, touch pad, or mouse action will occur. It often is a blinking solid line, an underline character, or a small arrow.

D

DDR SDRAM — double-data-rate SDRAM — A type of SDRAM that doubles the data burst cycle, improving system performance.

DDR2 SDRAM — double-data-rate 2 SDRAM — A type of DDR SDRAM that uses a 4-bit prefetch and other architectural changes to boost memory speed to over 400 MHz.

device — Hardware such as a disk drive, printer, or keyboard that is installed in or connected to your computer.

device driver — See *driver*.

DIMM — dual in-line memory module — A circuit board with memory chips that connects to a memory module on the system board.

DIN connector — A round, six-pin connector that conforms to DIN (Deutsche Industrie-Norm) standards; it is typically used to connect PS/2 keyboard or mouse cable connectors.

disk striping — A technique for spreading data over multiple disk drives. Disk striping can speed up operations that retrieve data from disk storage. Computers that use disk striping generally allow the user to select the data unit size or stripe width.

DMA — direct memory access — A channel that allows certain types of data transfer between RAM and a device to bypass the processor.

docking device — See *APR*.

DMTF — Distributed Management Task Force — A consortium of hardware and software companies who develop management standards for distributed desktop, network, enterprise, and Internet environments.

domain — A group of computers, programs, and devices on a network that are administered as a unit with common rules and procedures for use by a specific group of users. A user logs on to the domain to gain access to the resources.

DRAM — dynamic random-access memory — Memory that stores information in integrated circuits containing capacitors.

driver — Software that allows the operating system to control a device such as a printer. Many devices do not work properly if the correct driver is not installed in the computer.

DSL — Digital Subscriber Line — A technology that provides a constant, high-speed Internet connection through an analog telephone line.

dual-core — An Intel® technology in which two physical computational units exist inside a single processor package, thereby increasing computing efficiency and multi-tasking ability.

dual display mode — A display setting that allows you to use a second monitor as an extension of your display. Also referred to as *extended display mode*.

DVD-R — DVD recordable — A recordable version of a DVD. Data can be recorded only once onto a DVD-R. Once recorded, the data cannot be erased or written over.

DVD+RW — DVD rewritable — A rewritable version of a DVD. Data can be written to a DVD+RW disc, and then erased and written over (rewritten). (DVD+RW technology is different from DVD-RW technology.)

DVD+RW drive — drive that can read DVDs and most CD media and write to DVD+RW (rewritable DVDs) discs.

DVI — digital video interface — A standard for digital transmission between a computer and a digital video display.

E

ECC — error checking and correction — A type of memory that includes special circuitry for testing the accuracy of data as it passes in and out of memory.

ECP — extended capabilities port — A parallel connector design that provides improved bidirectional data transmission. Similar to EPP, ECP uses direct memory access to transfer data and often improves performance.

EIDE — enhanced integrated device electronics — An improved version of the IDE interface for hard drives and CD drives.

EMI — electromagnetic interference — Electrical interference caused by electromagnetic radiation.

ENERGY STAR® — Environmental Protection Agency requirements that decrease the overall consumption of electricity.

EPP — enhanced parallel port — A parallel connector design that provides bidirectional data transmission.

ESD — electrostatic discharge — A rapid discharge of static electricity. ESD can damage integrated circuits found in computer and communications equipment.

expansion card — A circuit board that installs in an expansion slot on the system board in some computers, expanding the capabilities of the computer. Examples include video, modem, and sound cards.

expansion slot — A connector on the system board (in some computers) where you insert an expansion card, connecting it to the system bus.

ExpressCard — A removable I/O card adhering to the PCMCIA standard. Modems and network adapters are common types of ExpressCards. ExpressCards support both the PCI Express and USB 2.0 standard.

Express Service Code — A numeric code located on a sticker on your Dell™ computer. Use the Express Service Code when contacting Dell for assistance. Express Service Code service may not be available in some countries.

extended display mode — A display setting that allows you to use a second monitor as an extension of your display. Also referred to as *dual display mode*.

extended PC Card — A PC Card that extends beyond the edge of the PC Card slot when installed.

F

Fahrenheit — A temperature measurement scale where 32° is the freezing point and 212° is the boiling point of water.

FBD — fully-buffered DIMM — A DIMM with DDR2 DRAM chips and an Advanced Memory Buffer (AMB) that speeds communication between the DDR2 SDRAM chips and the system.

FCC — Federal Communications Commission — A U.S. agency responsible for enforcing communications-related regulations that state how much radiation computers and other electronic equipment can emit.

fingerprint reader — A strip sensor that uses your unique fingerprint to authenticate your user identity to help secure your computer.

folder — A term used to describe space on a disk or drive where files are organized and grouped. Files in a folder can be viewed and ordered in various ways, such as alphabetically, by date, and by size.

format — The process that prepares a drive or disk for file storage. When a drive or disk is formatted, the existing information on it is lost.

FSB — front side bus — The data path and physical interface between the processor and RAM.

FTP — file transfer protocol — A standard Internet protocol used to exchange files between computers connected to the Internet.

G

G — gravity — A measurement of weight and force.

GB — gigabyte — A measurement of data storage that equals 1024 MB (1,073,741,824 bytes). When used to refer to hard drive storage, the term is often rounded to 1,000,000,000 bytes.

GHz — gigahertz — A measurement of frequency that equals one thousand million Hz, or one thousand MHz. The speeds for computer processors, buses, and interfaces are often measured in GHz.

graphics mode — A video mode that can be defined as *x* horizontal pixels by *y* vertical pixels by *z* colors. Graphics modes can display an unlimited variety of shapes and fonts.

GUI — graphical user interface — Software that interacts with the user by means of menus, windows, and icons. Most programs that operate on the Windows operating systems are GUIs.

H

hard drive — A drive that reads and writes data on a hard disk. The terms hard drive and hard disk are often used interchangeably.

heat sink — A metal plate on some processors that helps dissipate heat.

hibernate mode — A power management mode that saves everything in memory to a reserved space on the hard drive and then turns off the computer. When you restart the computer, the memory information that was saved to the hard drive is automatically restored.

HTTP — hypertext transfer protocol — A protocol for exchanging files between computers connected to the Internet.

Hyper-Threading — Hyper-Threading is an Intel technology that can enhance overall computer performance by allowing one physical processor to function as two logical processors, capable of performing certain tasks simultaneously.

Hz — hertz — A unit of frequency measurement that equals 1 cycle per second. Computers and electronic devices are often measured in kilohertz (kHz), megahertz (MHz), gigahertz (GHz), or terahertz (THz).

I

IC — integrated circuit — A semiconductor wafer, or chip, on which thousands or millions of tiny electronic components are fabricated for use in computer, audio, and video equipment.

IDE — integrated device electronics — An interface for mass storage devices in which the controller is integrated into the hard drive or CD drive.

IEEE 1394 — Institute of Electrical and Electronics Engineers, Inc. — A high-performance serial bus used to connect IEEE 1394-compatible devices, such as digital cameras and DVD players, to the computer.

infrared sensor — A port that allows you to transfer data between the computer and infrared-compatible devices without using a cable connection.

integrated — Usually refers to components that are physically located on the computer's system board. Also referred to as *built-in*.

I/O — input/output — An operation or device that enters and extracts data from your computer. Keyboards and printers are I/O devices.

I/O address — An address in RAM that is associated with a specific device (such as a serial connector, parallel connector, or expansion slot) and allows the processor to communicate with that device.

IrDA — Infrared Data Association — The organization that creates international standards for infrared communications.

IRQ — interrupt request — An electronic pathway assigned to a specific device so that the device can communicate with the processor. Each device connection must be assigned an IRQ. Although two devices can share the same IRQ assignment, you cannot operate both devices simultaneously.

ISP — Internet service provider — A company that allows you to access its host server to connect directly to the Internet, send and receive e-mail, and access websites. The ISP typically provides you with a software package, user name, and access phone numbers for a fee.

K

Kb — kilobit — A unit of data that equals 1024 bits. A measurement of the capacity of memory integrated circuits.

KB — kilobyte — A unit of data that equals 1024 bytes but is often referred to as 1000 bytes.

key combination — A command requiring you to press multiple keys at the same time.

kHz — kilohertz — A measurement of frequency that equals 1000 Hz.

L

LAN — local area network — A computer network covering a small area. A LAN usually is confined to a building or a few nearby buildings. A LAN can be connected to another LAN over any distance through telephone lines and radio waves to form a wide area network (WAN).

LCD — liquid crystal display — The technology used by portable computer and flat-panel displays.

LED — light-emitting diode — An electronic component that emits light to indicate the status of the computer.

local bus — A data bus that provides a fast throughput for devices to the processor.

LPT — line print terminal — The designation for a parallel connection to a printer or other parallel device.

M

Mb — megabit — A measurement of memory chip capacity that equals 1024 Kb.

Mbps — megabits per second — One million bits per second. This measurement is typically used for transmission speeds for networks and modems.

MB — megabyte — A measurement of data storage that equals 1,048,576 bytes. 1 MB equals 1024 KB. When used to refer to hard drive storage, the term is often rounded to 1,000,000 bytes.

MB/sec — megabytes per second — One million bytes per second. This measurement is typically used for data transfer ratings.

media bay — A bay that supports devices such as optical drives, a second battery, or a Dell TravelLite™ module.

memory — A temporary data storage area inside your computer. Because the data in memory is not permanent, it is recommended that you frequently save your files while you are working on them, and always save your files before you shut down the computer. Your computer can contain several different forms of memory, such as RAM, ROM, and video memory. Frequently, the word memory is used as a synonym for RAM.

memory address — A specific location where data is temporarily stored in RAM.

memory mapping — The process by which the computer assigns memory addresses to physical locations at start-up. Devices and software can then identify information that the processor can access.

memory module — A small circuit board containing memory chips, which connects to the system board.

MHz — megahertz — A measure of frequency that equals 1 million cycles per second. The speeds for computer processors, buses, and interfaces are often measured in MHz.

Mini PCI — A standard for integrated peripheral devices with an emphasis on communications such as modems and NICs. A Mini PCI card is a small external card that is functionally equivalent to a standard PCI expansion card.

Mini-Card — A small card designed for integrated peripherals, such as communication NICs. The Mini-Card is functionally equivalent to a standard PCI expansion card.

modem — A device that allows your computer to communicate with other computers over analog telephone lines. Three types of modems include: external, PC Card, and internal. You typically use your modem to connect to the Internet and exchange e-mail.

module bay — See *media bay*.

MP — megapixel — A measure of image resolution used for digital cameras.

ms — millisecond — A measure of time that equals one thousandth of a second. Access times of storage devices are often measured in ms.

N

network adapter — A chip that provides network capabilities. A computer may include a network adapter on its system board, or it may contain a PC Card with an adapter on it. A network adapter is also referred to as a *NIC* (network interface controller).

NIC — See *network adapter*.

notification area — The section of the Windows taskbar that contains icons for providing quick access to programs and computer functions, such as the clock, volume control, and print status. Also referred to as *system tray*.

ns — nanosecond — A measure of time that equals one billionth of a second.

NVRAM — nonvolatile random access memory — A type of memory that stores data when the computer is turned off or loses its external power source. NVRAM is used for maintaining computer configuration information such as date, time, and other system setup options that you can set.

O

optical drive — A drive that uses optical technology to read or write data from CDs, DVDs, or DVD+RWs. Example of optical drives include CD drives, DVD drives, CD-RW drives, and CD-RW/DVD combo drives.

P

parallel connector — An I/O port often used to connect a parallel printer to your computer. Also referred to as an *LPT port*.

partition — A physical storage area on a hard drive that is assigned to one or more logical storage areas known as logical drives. Each partition can contain multiple logical drives.

PC Card — A removable I/O card adhering to the PCMCIA standard. Modems and network adapters are common types of PC Cards.

PCI — peripheral component interconnect — PCI is a local bus that supports 32-and 64-bit data paths, providing a high-speed data path between the processor and devices such as video, drives, and networks.

PCI Express — A modification to the PCI interface that boosts the data transfer rate between the processor and the devices attached to it. PCI Express can transfer data at speeds from 250 MB/sec to 4 GB/sec. If the PCI Express chip set and the device are capable of different speeds, they will operate at the slower speed.

PCMCIA — Personal Computer Memory Card International Association — The organization that establishes standards for PC Cards.

PIO — programmed input/output — A method of transferring data between two devices through the processor as part of the data path.

pixel — A single point on a display screen. Pixels are arranged in rows and columns to create an image. A video resolution, such as 800 x 600, is expressed as the number of pixels across by the number of pixels up and down.

Plug-and-Play — The ability of the computer to automatically configure devices. Plug and Play provides automatic installation, configuration, and compatibility with existing hardware if the BIOS, operating system, and all devices are Plug and Play compliant.

POST — power-on self-test — Diagnostics programs, loaded automatically by the BIOS, that perform basic tests on the major computer components, such as memory, hard drives, and video. If no problems are detected during POST, the computer continues the start-up.

processor — A computer chip that interprets and executes program instructions. Sometimes the processor is referred to as the CPU (central processing unit).

PS/2 — personal system/2 — A type of connector for attaching a PS/2-compatible keyboard, mouse, or keypad.

PXE — pre-boot execution environment — A WfM (Wired for Management) standard that allows networked computers that do not have an operating system to be configured and started remotely.

R

RAID — redundant array of independent disks — A method of providing data redundancy. Some common implementations of RAID include RAID 0, RAID 1, RAID 5, RAID 10, and RAID 50.

RAM — random-access memory — The primary temporary storage area for program instructions and data. Any information stored in RAM is lost when you shut down your computer.

readme file — A text file included with a software package or hardware product. Typically, readme files provide installation information and describe new product enhancements or corrections that have not yet been documented.

read-only — Data and/or files you can view but cannot edit or delete. A file can have read-only status if:

- It resides on a physically write-protected floppy disk, CD, or DVD.
- It is located on a network in a directory and the system administrator has assigned rights only to specific individuals.

refresh rate — The frequency, measured in Hz, at which your screen's horizontal lines are recharged (sometimes also referred to as its *vertical frequency*). The higher the refresh rate, the less video flicker can be seen by the human eye.

resolution — The sharpness and clarity of an image produced by a printer or displayed on a monitor. The higher the resolution, the sharper the image.

RFI — radio frequency interference — Interference that is generated at typical radio frequencies, in the range of 10 kHz to 100,000 MHz. Radio frequencies are at the lower end of the electromagnetic frequency spectrum and are more likely to have interference than the higher frequency radiations, such as infrared and light.

ROM — read-only memory — Memory that stores data and programs that cannot be deleted or written to by the computer. ROM, unlike RAM, retains its contents after you shut down your computer. Some programs essential to the operation of your computer reside in ROM.

RPM — revolutions per minute — The number of rotations that occur per minute. Hard drive speed is often measured in rpm.

RTC — real time clock — Battery-powered clock on the system board that keeps the date and time after you shut down the computer.

RTCRST — real-time clock reset — A jumper on the system board of some computers that can often be used for troubleshooting problems.

S

SAS — serial attached SCSI — A faster, serial version of the SCSI interface (as opposed to the original SCSI parallel architecture).

SATA — serial ATA — A faster, serial version of the ATA (IDE) interface.

ScanDisk — A Microsoft utility that checks files, folders, and the hard disk's surface for errors. ScanDisk often runs when you restart the computer after it has stopped responding.

SCSI — small computer system interface — A high-speed interface used to connect devices to a computer, such as hard drives, CD drives, printers, and scanners. The SCSI can connect many devices using a single controller. Each device is accessed by an individual identification number on the SCSI controller bus.

SDRAM — synchronous dynamic random-access memory — A type of DRAM that is synchronized with the optimal clock speed of the processor.

serial connector — An I/O port often used to connect devices such as a handheld digital device or digital camera to your computer.

Service Tag — A bar code label on your computer that identifies your computer when you access Dell Support at **support.dell.com** or when you call Dell for customer service or technical support.

setup program — A program that is used to install and configure hardware and software. The **setup.exe** or **install.exe** program comes with most Windows software packages. *Setup program* differs from *system setup*.

shortcut — An icon that provides quick access to frequently used programs, files, folders, and drives. When you place a shortcut on your Windows desktop and double-click the icon, you can open its corresponding folder or file without having to find it first. Shortcut icons do not change the location of files. If you delete a shortcut, the original file is not affected. Also, you can rename a shortcut icon.

SIM — Subscriber Identity Module — A SIM card contains a microchip that encrypts voice and data transmissions. SIM cards can be used in phones or portable computers.

smart card — A card that is embedded with a processor and a memory chip. Smart cards can be used to authenticate a user on computers equipped for smart cards.

S/PDIF — Sony/Philips Digital Interface — An audio transfer file format that allows the transfer of audio from one file to another without converting it to and from an analog format, which could degrade the quality of the file.

standby mode — A power management mode that shuts down all unnecessary computer operations to save energy.

Strike Zone™ — Reinforced area of the platform base that protects the hard drive by acting as a dampening device when a computer experiences resonating shock or is dropped (whether the computer is on or off).

surge protectors — Prevent voltage spikes, such as those that may occur during an electrical storm, from entering the computer through the electrical outlet. Surge protectors do not protect against lightning strikes or against brownouts, which occur when the voltage drops more than 20 percent below the normal AC-line voltage level.

Network connections cannot be protected by surge protectors. Always disconnect the network cable from the network connector during electrical storms.

SVGA — super-video graphics array — A video standard for video cards and controllers. Typical SVGA resolutions are 800 x 600 and 1024 x 768.

The number of colors and resolution that a program displays depends on the capabilities of the monitor, the video controller and its drivers, and the amount of video memory installed in the computer.

S-video TV-out — A connector used to attach a TV or digital audio device to the computer.

SXGA — super-extended graphics array — A video standard for video cards and controllers that supports resolutions up to 1280 x 1024.

SXGA+ — super-extended graphics array plus — A video standard for video cards and controllers that supports resolutions up to 1400 x 1050.

system board — The main circuit board in your computer. Also known as the *motherboard*.

system setup — A utility that serves as an interface between the computer hardware and the operating system. System setup allows you to configure user-selectable options in the BIOS, such as date and time or system password. Unless you understand what effect the settings have on the computer, do not change the settings for this program.

T

TAPI — telephony application programming interface — Enables Windows programs to operate with a wide variety of telephony devices, including voice, data, fax, and video.

text editor — A program used to create and edit files that contain only text; for example, Windows Notepad uses a text editor. Text editors do not usually provide word wrap or formatting functionality (the option to underline, change fonts, and so on).

TPM — trusted platform module — A hardware-based security feature that when combined with security software enhances network and computer security by enabling features such as file and e-mail protection.

travel module — A plastic device designed to fit inside the module bay of a portable computer to reduce the weight of the computer.

U

UMA — unified memory allocation — System memory dynamically allocated to video.

UPS — uninterruptible power supply — A backup power source used when the electrical power fails or drops to an unacceptable voltage level. A UPS keeps a computer running for a limited amount of time when there is no electrical power. UPS systems typically provide surge suppression and may also provide voltage regulation. Small UPS systems provide battery power for a few minutes to enable you to shut down your computer.

USB — universal serial bus — A hardware interface for a low-speed device such as a USB-compatible keyboard, mouse, joystick, scanner, set of speakers, printer, broadband devices (DSL and cable modems), imaging devices, or storage devices. Devices are plugged directly in to a 4-pin socket on your computer or in to a multi-port hub that plugs in to your computer. USB devices can be connected and disconnected while the computer is turned on, and they can also be daisy-chained together.

UTP — unshielded twisted pair — Describes a type of cable used in most telephone networks and some computer networks. Pairs of unshielded wires are twisted to protect against electromagnetic interference, rather than relying on a metal sheath around each pair of wires to protect against interference.

UXGA — ultra extended graphics array — A video standard for video cards and controllers that supports resolutions up to 1600 x 1200.

V

video controller — The circuitry on a video card or on the system board (in computers with an integrated video controller) that provides the video capabilities—in combination with the monitor—for your computer.

video memory — Memory that consists of memory chips dedicated to video functions. Video memory is usually faster than system memory. The amount of video memory installed primarily influences the number of colors that a program can display.

video mode — A mode that describes how text and graphics are displayed on a monitor. Graphics-based software, such as Windows operating systems, displays in video modes that can be defined as *x* horizontal pixels by *y* vertical pixels by *z* colors. Character-based software, such as text editors, displays in video modes that can be defined as *x* columns by *y* rows of characters.

video resolution — See *resolution*.

virus — A program that is designed to inconvenience you or to destroy data stored on your computer. A virus program moves from one computer to another through an infected disk, software downloaded from the Internet, or e-mail attachments. When an infected program starts, its embedded virus also starts.

A common type of virus is a boot virus, which is stored in the boot sectors of a floppy disk. If the floppy disk is left in the drive when the computer is shut down and then turned on, the computer is infected when it reads the boot sectors of the floppy disk expecting to find the operating system. If the computer is infected, the boot virus may replicate itself onto all the floppy disks that are read or written in that computer until the virus is eradicated.

V — volt — The measurement of electric potential or electromotive force. One V appears across a resistance of 1 ohm when a current of 1 ampere flows through that resistance.

W

W — watt — The measurement of electrical power. One W is 1 ampere of current flowing at 1 volt.

WHr — watt-hour — A unit of measure commonly used to indicate the approximate capacity of a battery. For example, a 66-WHr battery can supply 66 W of power for 1 hour or 33 W for 2 hours.

wallpaper — The background pattern or picture on the Windows desktop. Change your wallpaper through the Windows Control Panel. You can also scan in your favorite picture and make it wallpaper.

WLAN — wireless local area network. A series of interconnected computers that communicate with each other over the air waves using access points or wireless routers to provide Internet access.

write-protected — Files or media that cannot be changed. Use write-protection when you want to protect data from being changed or destroyed. To write-protect a 3.5-inch floppy disk, slide its write-protect tab to the open position.

WWAN — wireless wide area network. A wireless high-speed data network using cellular technology and covering a much larger geographic area than WLAN.

WXGA — wide-aspect extended graphics array — A video standard for video cards and controllers that supports resolutions up to 1280 x 800."

X

XGA — extended graphics array — A video standard for video cards and controllers that supports resolutions up to 1024 x 768.

Z

ZIF — zero insertion force — A type of socket or connector that allows a computer chip to be installed or removed with no stress applied to either the chip or its socket.

Zip — A popular data compression format. Files that have been compressed with the Zip format are called Zip files and usually have a filename extension of **.zip**. A special kind of zipped file is a self-extracting file, which has a filename extension of **.exe**. You can unzip a self-extracting file by double-clicking it.

Zip drive — A high-capacity floppy drive developed by Iomega Corporation that uses 3.5-inch removable disks called Zip disks. Zip disks are slightly larger than regular floppy disks, about twice as thick, and hold up to 100 MB of data.

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